National Institute on Alcohol Abuse and Alcoholism

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Alcohol Use Among U. S. Ethnic Minorities

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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Alcohol Use Among U.S. Ethnic Minorities

Proceedings of a conference on the Epidemiology of Alcohol Use and Abuse Among Ethnic Minority Groups

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration
National Institute on Alcohol Abuse and Alcoholism
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This publication is the result of a conference to review the state of the art of epidemiologic research concerning alcohol use and abuse among the major racial/ethnic minority groups in the United States. The Conference was held at the National Institutes of Health, Wilson Hall, Bethesda, Maryland, September 11-14, 1985. The presentations herein are those of the authors listed and may not necessarily reflect the opinions, official policy, or position of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) or any other part of the U.S. Department of Health and Human Services.

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FOREWORD

Nearly 1 out of every 4 persons in the United States belongs to a racial or ethnic minority. At the time of the 1980 Census, Black Americans, Hispanic Americans, American Indians, Alaska Natives, and Asian/Pacific Americans constituted an estimated 52.7 million of 226.5 million Americans. This cultural diversity is a distinctive and valued characteristic of our society.

Generally, all Americans have evidenced improved health over the past decade. Yet most minority groups continue to have higher death rates from chronic diseases, higher infant and maternal mortality, and lower life expectancies than nonminorities. Such imbalances in these and other measures of health status for certain segments of our population are a challenge to both our overall health delivery and our social system.

Certainly one of the biggest challenges is the misuse of legal and illegal drugs, with alcohol prominent among them. In 1985, a national survey found that the majority of adults and 12- to 17-year-olds reported having used alcohol at some point in their lives. Nearly one-third of 12- to 17-year-olds reported alcohol consumption in the past 30 days. This evidence of current drinking, especially among the young, is disturbing. Also alarming is the estimate of the National Institute on Alcohol Abuse and Alcoholism that 1 of every 10 Americans can be classified as a problem drinker.

Variations in drinking patterns and drinking problems have been noted among different racial and ethnic groups for over 20 years. Many such reports have provided evidence that the frequency of alcohol problems is disturbingly high in some of these groups. It was against this background that the Conference on the Epidemiology of Alcohol Use and Abuse Among U.S. Ethnic Minority Groups was convened by the National Institute on Alcohol Abuse and Alcoholism on September 11-14, 1985. The 40 experts who participated in this 4-day meeting addressed many alcohol issues that apply to specific minority groups, as well as issues that apply to all groups, and they made important recommendations to guide future research.

This publication is presented in the belief that only through the sharing and application of our knowledge in this area will we be able to understand and treat the formidable health problems associated with alcohol abuse. We hope this report will be useful in guiding further discussion and further research to preserve and improve the health of all our citizens.

Enoch Gordis, M.D.
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PREFACE

In recent years increased attention has been directed toward understanding the patterns and levels of alcohol use and abuse among minority populations in the United States. A number of recently completed national surveys, as well as earlier and more localized surveys, have found disproportionately high levels of alcohol consumption and alcohol-related problems among some minority populations. Based on this evidence, the National Institute on Alcohol Abuse and Alcoholism convened a 4-day meeting of some 40 experts on alcohol use and abuse among ethnic and racial minority groups.

Presentations and discussions at the 4-day conference were focused on four major ethnic or racial groups in the United States: Black Americans, Hispanic Americans, American Indians and Alaska Natives, and Asian/Pacific Americans. Experts from different disciplines and regions of the United States either reviewed current knowledge about alcohol and minorities from past research findings or presented results of their own survey or ethnographic studies. In addition, preliminary findings from four new data sets were presented at the conference. These data sets, which are the result of collaboration between NIAAA and the National Center for Health Statistics (NCHS), included the Hispanic Health and Nutrition Examination Survey (Hispanic HANES), the 1983 National Health Interview Survey (NHIS) Alcohol Supplement, the Multiple Cause Mortality Data, and the Health and Nutrition Examination Survey I (NHANES I) Epidemiologic Followup Study.

The national data sets are part of a comprehensive data system from which the Division of Biometry and Epidemiology of NIAAA maintains national surveillance of alcohol abuse and alcoholism and conducts analyses of the medical, psychological, and environmental aspects for majority as well as minority populations. For the past several years, the division has directed increased attention to determining the prevalence and distribution of alcohol abuse and alcoholism among U.S. minority groups. The division welcomed the opportunity to convene at this conference some of the best minds in the alcohol field, and we are committed to supporting the research recommendations offered by conference participants.

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III. Alcohol Use Among American Indians and Alaska Natives

American Indians and Alcohol: Epidemiological and Sociocultural Relevance, 207
Dwight B. Heath

Alaskan Natives and Alcohol: A Sociocultural and Epidemiological Review, 223
Dennis Kelso and William DuBay

Epidemiology and Correlates of Alcohol Use Among Indian Adolescents Living on Reservations, 239
E. R. Oetting and Fred Beauvais

Pass the Bottle, Bro!: A Comparison of Urban and Rural Indian Drinking Patterns, 269
Joan C. Weibel-Orlando

Alcohol Abuse and Major Affective Disorders: Advances in Epidemiologic Research Among American Indians, 291
Spero M. Manson, James H. Shore, Joseph D. Bloom, George Keepers, and Gordon Neligh

American Indian Alcohol Misuse and Treatment Outcome, 301
R. Dale Walker, G. Andrew Benjamin, Daniel Kivlahan, and Patricia Silk Walker

IV. Alcohol Use Among Asian/Pacific Americans

Alcohol Use and Abuse Among Four Ethnic Groups in Hawaii: Native Hawaiians, Japanese, Filipinos, and Caucasians, 315
Frank M. Ahern

Alcohol Use, Abuse, and Alcoholism Among Chinese Americans: A Review of the Epidemiologic Data, 329
Elena S. H. Yu, William T. Liu, Zhengyi Xia, and Mingyuan Zhang

An Epidemiological Survey of Alcohol, Drug, and Mental Health Problems in Hawaii: A Comparison of Four Ethnic Groups, 343
Sharon R. Murakami

Alcohol Consumption Patterns Among the Five Major Ethnic Groups in Hawaii: Correlations with Incidence of Esophageal and Oropharyngeal Cancer, 355
Loïc Le Marchand, Laurence N. Kolonel, and Carl N. Yoshizawa

Asian Americans and Alcohol: The Chinese, Japanese, Koreans, and Filipinos in Los Angeles, 373
Harry H. L. Kitano and Iris Chi

The Flushing Response and Alcohol Use, 383
Ronald C. Johnson

CONTENTS

Foreword, iii
Preface, v
Conference Participants, xi
Research Highlights, xv

I. Alcohol Use Among Black Americans

The Epidemiology of Drinking Patterns and Alcohol-Related Problems Among U.S. Blacks, 3
Denise Herd

Alcohol Use Among Black and White Teenagers, 51
Thomas Harford and Cherry Lowman

Alcohol Abuse in Blacks and Whites as Indicated in the Epidemiological Catchment Area Program, 63
Lee N. Robins

Alcohol Use and Related Problems Among Black and White Gynecologic Patients, 75
Marcia Russell

Alcohol Behaviors Among Southern Blacks and Whites: A Comparative Analysis, 95
George J. Warheit, Joanne Buhl Auth, and Betty Smith Black

II. Alcohol Use Among Hispanic Americans

Alcohol-Related Practices, Problems, and Norms Among Mexican Americans: An Overview, 115
M. Jean Gilbert

State-of-the-Art Review: Caribbean Hispanics and Their Alcohol Use, 135
Andrew J. Gordon

Drinking Patterns and Alcohol Problems in a National Sample of U.S. Hispanics, 147
Raul Caetano

Prevalence of Alcohol Abuse and Dependence Among Mexican Americans and Non-Hispanic Whites in the Community, 163
M. Audrey Burnam

Prevalence of Alcohol Abuse and Dependence in Puerto Rico, 179
Glorisa J. Canino, Hector Bird, Maritza Rubio, Kenneth P. Geil, Milagros Bravo, and Patrick Shrout

Alcohol Use and Homicide Victimization: An Examination of Racial/Ethnic Differences, 191
Richard A. Goodman, James A. Mercy, and Mark L. Rosenberg

V. National Data Presentations

Alcohol Use and Abuse Among U.S. Minority Groups: Results From the 1983 National Health Interview Survey, 399
Ronald W. Wilson and Gerald D. Williams

NHANES I Epidemiologic Followup Study: Methodological Issues and Preliminary Findings, 411
James Colliver, M. Beth Grigson, Helen Barbano, Mary Dufour, and Henry Malin

Self-Reported Alcohol Use and Abuse Among Mexican Americans: Preliminary Findings From the Hispanic Health and Nutrition Examination Survey Adult Sample Person Supplement, 425
Charles M. Christian, Terry S. Zobeck, Henry J. Malin, and Dale C. Hitchcock

Multiple Cause Mortality Data: General Description, Methodological Issues, and Preliminary Findings, 439
Mary C. Dufour, Darryl Bertolucci, and James Weed

The Incidence of and Survival From Alcohol-Related Cancers in U.S. Minorities, 451
John L. Young, John W. Horm, and Lynn Gloeckler Ries

VI. Issues and Recommendations

Methodological Issues in Alcohol Research on Ethnic Minorities: Sources of Bias, 461
Joseph Westermeyer

Conference Recommendations, 465

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Research Highlights

This section highlights the major research findings presented at the conference as they relate to each of the four major racial or ethnic groups considered.

Black Americans

Drinking Patterns and Prevalence of Alcohol Problems

Black Americans, numbering 27 million and comprising about 12 percent of the total population, are the Nation's largest racial minority group. Despite the large size of the black population and the high rate of alcohol-related problems in this population, relatively little alcohol research has focused on blacks. Still, more alcohol-related information is available on blacks than any other minority group.

In her presentation to the conference Denise Herd noted that throughout most of the 19th century, blacks were strongly influenced by the temperance movement and reportedly had low rates of alcohol-related problems. Before the Civil War, blacks found the temperance movement appealing because it was closely allied with the antislavery movement. After the war ended and slavery was abolished, blacks continued to advocate temperance through their own organizations. By the early 20th century, however, traditional black attitudes favoring abstinence began to weaken, partly because the temperance movement in the South had become increasingly segregationist and unfriendly to blacks. Their migration in large numbers from the rural South to northern cities, beginning at the turn of the century, also changed black attitudes about drinking. Today a disproportionate number of American blacks experience alcohol problems.

Intensive study of drinking patterns and their consequences for Americans is a relatively new endeavor. Although few blacks were included in the landmark surveys of the 1960s and 1970s, results of those early studies suggested that alcohol consumption patterns were similar for black males and white males but dissimilar for black females and white females. The dissimilarity in black and white female drinking patterns generally appears to hold true today.

Herd noted that extensive data on black drinking patterns and problems were first obtained in a 1984 national survey of large representative samples of blacks and Hispanics. As in earlier studies, the findings in this survey suggested that black men and white men have roughly similar drinking patterns but that black women and white women do not. Twenty-nine percent of black men and 24 percent of white men were classified as abstainers. The percentages of infrequent, less frequent, and frequent low or high maximum drinkers were identical for men in both races—about 10 percent, 16 percent, and 30 percent respectively. At the high end of the drinking spectrum, 19 percent of white men and 15 percent of black men were frequent heavier drinkers. Differences between the races were more pronounced among women. Nearly one-half (46 percent) of black women were classified as abstainers, compared with only about one-third (34 percent) of white women. Although similar percentages of infrequent and less frequent female drinkers were found in both races, approximately twice as many white women as black women were classified as frequent high maximum drinkers. In the heaviest drinking category, however, there were nearly identical proportions of black women (4 percent) and white women (5 percent).

Despite some apparent similarities in drinking patterns for the two races, separate analyses by age group revealed racial differences in drinking patterns. For example, white men 18 through 29 years of age were more likely than black men of this age group to be frequent heavy drinkers. Similar racial differences were evident for females in the 18-29 age group, with black women more likely than white women to be abstainers, less frequent drinkers, and consumers of less alcohol per occasion.

The age of transition into heavy drinking is a major issue to be addressed in studying blacks. As noted, black youth drink less than white youth and are more likely to abstain from alcohol. Yet blacks in the middle-age cohorts have significantly more alcohol-related medical problems than whites of comparable age. In fact, the pattern of age-specific alcohol problems is essentially reversed in blacks and whites. The age of heaviest alcohol consumption among whites is the twenties, with many whites starting to drink in their teens. In contrast, blacks tend more toward abstinence or moderation in youth and early adulthood, but the problems associated with heavy drinking are more frequent among middle-aged blacks than among middle-aged whites. The reasons for this pattern are unclear. This pattern may be the result of cultural factors that delay the onset of drinking in blacks, or it may be due to life experiences or other cohort effects that have made the older age group particularly vulnerable to alcohol-related medical problems.

The growing body of evidence for racial and ethnic differences in alcohol consumption and related problems now includes data from the 1983 National Health Interview Survey (NHIS) Alcohol Supplement. The NHIS Alcohol Supplement, a cooperative effort between the National Institute on Alcohol Abuse and Alcoholism and the National Center for Health Statistics, was administered to a national household probability sample that included more than 22,000 individuals. NHIS collected data on drinking practices, drinking problems, self-reported health status and health practices, and selected sociodemographic characteristics for the U.S. civilian, noninstitutional population, including minority identifiers. (Similar data were also collected in 1988.)

The NHIS results reported by Ronald Wilson and Gerald Williams indicate significant differences between blacks and whites in abstinence. The proportion of abstainers was 57 percent among blacks and 36 percent among whites, a substantial difference. However, the difference in the proportion of light drinkers between blacks (20 percent) and whites (31 percent) was less pronounced. The same pattern was true for moderate drinkers (14 percent of blacks, 22 percent of whites) and for heavier drinkers (7 percent of blacks, 10 percent of whites).

Data from the NHIS Alcohol Supplement also suggest that race or ethnicity may be less important than sociodemographic characteristics in assessing levels of alcohol consumption. For example, drinking generally decreases with age. Separated and divorced men are more likely to be heavier drinkers than married or never-married men. And drinking tends to decrease with declining levels of education and family income. The NHIS Alcohol Supplement data also indicate a somewhat heavier drinking style among unemployed whites and blacks.

Similar relationships were found among men and women. Both male and female whites reported a somewhat better health status than blacks. Interestingly, among both races more moderate drinkers reported better health than either abstainers or heavier drinkers.

Regional studies of alcohol use among blacks generally support and extend the findings of recent national surveys. George Warheit reviewed findings from a descriptive epidemiologic survey of alcohol use and problem drinking among blacks and whites in the Southeast. This study, which was conducted in the early 1970s and mid-1980s, showed a higher proportion of abstainers among blacks than among whites. The highest prevalence of current alcohol use (94 percent) was found among white males 18 through 29 years of age. The lowest prevalence (16 percent) was reported for black females 60 years and older. Blacks tended to start drinking later than whites in most age cohorts. In both races, more males than females were found to be consumers of alcohol. The lowest current prevalence of alcohol abuse or dependence, as determined by the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule, occurred among white males in the 18-25 age group and black males in the 30-59 age group. However, Warheit recommended caution in interpreting the finding for blacks because of the small sample size. Of particular significance was the finding that alcohol abuse or dependence occurred at some time in the lives of approximately 25 percent of all males, black or white; the rates for both black and white females were much lower.

A recent and detailed source of data on alcohol problems among minorities is the Epidemiologic Catchment Area (ECA) program, a series of epidemiologic studies sponsored by NIMH and conducted by independent research teams in five geographic areas in the United States from 1979 through 1984. ECA data have special epidemiologic value because they provide measures of alcohol abuse and dependence for large populations in both private households and institutions, and they use the criteria of the third edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) of the American Psychiatric Association. They also include standardized interview measures of possible childhood precursors of adult alcohol problems.

Lee Robins reviewed three ECA studies, in Baltimore, St. Louis, and North Carolina. These studies showed no difference in rates of lifetime or current alcohol disorders between blacks and whites even when the black population was standardized to white age and sex distributions. However, young blacks had lower rates of lifetime and current alcohol use than young whites, while the rates for middle-aged blacks were higher than the rates for their white counterparts. Similar behavior problems and early drunkenness were predictors of later alcohol disorders among both blacks and whites, but these predictors were more sensitive for whites. Being a high school dropout was a significant predictor of subsequent alcohol disorders among young blacks.

Alcohol Abuse Among Black Women

Few studies have examined factors that may contribute to heavier drinking among black women. Marcia Russell presented findings from her study on gynecologic outpatients in New York State on the associations of age, education, marital status, employment, and number of living children with drinking patterns and indications of alcohol-related problems. The prevalence of heavy drinking was similar among blacks and whites, but there were significantly more abstainers and fewer light or moderate drinkers among the black patients. Young white women had comparatively high rates of heavy drinking that decreased with age; young black women had low rates that increased through their forties and then fell to about the same level reported for whites.

Black housewives reported high rates of heavy drinking compared with low rates for white housewives. Black women who were not housewives tended to have rates of heavy drinking that were about the same or lower than white women in the same category. Russell suggested that the high rate of heavy drinking among the black gynecologic patients may be related to the fact that more of the blacks had never been married, were unemployed, and had no education beyond high school–all factors associated with higher rates of heavy drinking and alcohol-related problems.

Alcohol Use Among Black Teenagers

There has been a widespread belief, reflected in the earlier literature, that heavy drinking and drinking problems begin early among black youth. Alcohol has been believed to be pervasive in ghetto environments, leading to early and widespread initiation of black youth into adult drinking patterns. As noted by Herd, however, recent surveys have consistently found that fewer black than white adolescents drink at all, and that those who do, drink less frequently, get drunk less often, and have lower rates of heavy and problem drinking than whites. Nationwide surveys of junior and senior high school students have also found that black adolescents are more likely to abstain than white, Hispanic, or American Indian adolescents.

Racial differences in alcohol practices and problems are evident among teenage youth. Several studies suggest that both the frequency of alcohol use and the amount consumed are lower among black students than among white students. Thomas Harford cited findings on alcohol use among teenagers from the National Survey of Senior High School Students–a periodic cross-sectional survey of a nationally representative sample of students in grades 10, 11, and 12. For the 1977-78 school year, the survey results showed that self-reported abstinence rates were higher for black than for nonblack students and that lower proportions of blacks were heavy drinkers. The lower prevalence of heavier drinking among black students persisted even when demographic variables were controlled. Patterns of increasingly frequent alcohol use appeared to be grade related, as was the reported onset of alcohol use. Thus the survey indicated that there were more black teenagers in the 12th grade than in the 10th grade who drank and that they drank more frequently. Overall, however, the onset of drinking among black youth appears to be delayed.

Alcohol-Related Morbidity, Mortality, and Social Consequences

The incidence of medical problems associated with drinking, especially cirrhosis, is very high among blacks. Before the mid-1950s, age-adjusted rates of cirrhosis mortality for the nonwhite population, which during that period was more than 90 percent black, were generally lower than for the white population. This pattern reversed dramatically after 1950; between 1951 and 1973 nonwhite cirrhosis rates increased by 242 percent, while rates for whites rose by 60 percent. Although there has been a general decline in cirrhosis mortality, cirrhosis rates among nonwhite Americans remain about twice the rate for whites. Furthermore, in 1975, for both sexes, cirrhosis mortality among nonwhites reached a peak roughly 10 years earlier than among whites. In the older age groups, however, nonwhites have lower cirrhosis death rates than whites; white men over 65 years of age are at much greater risk than nonwhites of dying of cirrhosis.

Cirrhosis mortality among blacks has been linked to patterns of migration and urbanization. Nonwhite cirrhosis rates rose steeply in regions of major black migration between 1949 and 1970 but remained low among blacks remaining in the Deep South. A similar geographic pattern is revealed in national surveys of clients in alcoholism treatment programs, which report highly disproportionate numbers of blacks in treatment in urban Northeastern States compared with blacks living in the South.

Data from the NHANES I Epidemiologic Followup Survey, collected from 1982 to 1984, substantiate racial differences in morbidity and mortality. James Colliver and colleagues reported that in general, whites outlive blacks, females live longer than males, and excess mortality is higher among blacks than among whites. Starting at around 35 years of age, blacks are more susceptible than whites to heart disease. Black females are at greatest risk of heart disease, and white females have the lowest risk. Heart attacks are more prevalent among blacks, especially males, than among whites.

Data for 1978-81 from the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) program, presented by John Young, indicated that blacks and other minorities are at greater risk for certain types of alcohol-related cancers. For example, blacks, along with Chinese and Puerto Ricans, experience higher risks of cancers of the oral cavity and esophagus. Alcohol is considered an important etiological factor in these kinds of cancers.

Recent research on blacks, alcohol consumption, and automobile accidents and arrests has been limited. However, several studies in the 1960s concluded that blacks are at greater risk than whites for drinking-related accidents and arrests. The results suggested that when accidents occur, blacks either have higher blood alcohol levels than whites or are more vulnerable than whites to accidents and arrests at the same blood alcohol level. Since the 1960s, arrest rates for drunkenness have greatly declined for both blacks and whites and are now similar for both races. This decline may be related to the decriminalization of intoxication, changes in law enforcement practices, and the expansion of alcohol treatment services. Recent data on alcohol-related crimes do not generally support the view that blacks are more likely than whites to become involved in crimes in which alcohol is a factor.

Hispanic Americans

Drinking Patterns and Prevalance of Alcohol Problems

There are approximately 15 million Hispanic Americans, making them the second largest ethnic minority in the United States. Hispanic Americans are a culturally diverse group, made up predominately of Mexican Americans, followed numerically by Puerto Ricans, Cubans, Dominicans, and other groups.

Studies on alcohol consumption have generally concluded that the drinking patterns of Hispanics differ from those of other ethnic groups and that there are more alcohol-related problems among Hispanics. Research on Hispanics in several regions and different countries of origin has suggested a higher prevalance of current heavy drinking and alcohol-related problems among Hispanic males than among non-Hispanic males. However, Hispanic females were found to be less likely than non-Hispanic women to drink heavily or to report having alcohol problems.

Two recent national surveys have supported findings from these smaller studies and have provided new information on patterns of alcohol use among Hispanics. Raul Caetano presented a paper at the conference on his findings from a 1984 national survey of Hispanics and compared those results with his earlier study of Hispanics in the San Francisco Bay Area, about 80 percent of whom were Mexican American.

Caetano reported that only one-fifth of Hispanic men were abstainers compared with one-half of Hispanic women, and for both sexes drinking was positively associated with income and education. The overall rate of abstention among Hispanic men was found to be lower than the rate for the national U.S. population but higher than that found for Northern Californian Hispanic men. Similarly, the rate of abstention among Hispanic women nationally was higher than that of Hispanic women in California.

Caetano pointed out that frequent heavy drinking and problems among Hispanic men do not decline from their twenties to thirties as would be expected from the general U.S. population, but rather, they increase among Hispanics during that time. Caetano's data further indicate that foreign-born Hispanics drink less than first-generation Hispanic men and women born in the United States. Mexican American men have both the highest rate of abstention and the highest rate of heavy drinking when compared with Cubans, Puerto Ricans, and other Latin Americans.

National data on alcohol prevalence among U.S. Hispanics have also been obtained from the Hispanic Health and Nutrition Examination Survey (HANES) supported by the National Center for Health Statistics and the National Institute on Alcohol Abuse and Alcoholism. Information was collected between 1982 and 1984 on large samples of Mexican Americans in five southwestern states (Texas, California, Arizona, New Mexico, and Colorado); Cuban Americans in Dade County, Florida; and Puerto Ricans in the New York City area. Only the results on Mexican Americans were available at the time of the conference, and the data had not yet been age-adjusted, weighted, or tested for statistical significance. The conclusions presented by Charles Christian and colleagues should therefore be regarded as provisional.

The Hispanic HANES found that approximately one-half of Mexican Americans abstain from alcohol, including the 4 percent who are former drinkers. This is a much higher abstinence rate than in the general population. Sociodemographic characteristics were found to be particularly important in understanding drinking behavior. The proportion of current drinkers among Mexican Americans was highest between the ages of 18 and 54 years, after which it tapered off substantially. Men were about twice as likely as women to be drinkers, and the proportion of drinkers tended to increase with level of education and income. Spanish-speaking respondents had a much higher percentage of abstainers than English-speaking respondents, although there were similar proportions of occasional drinkers in both language groups.

In her review on Mexican American drinking practices, M. Jean Gilbert pointed out that there has been no definitive research indicating the extent to which Mexican Americans, or any other Hispanic subgroup, are at risk of alcoholism or alcohol-related problems. Gilbert noted that previously published alcohol research on Mexican Americans has centered primarily in Texas and California, the two States with the highest concentrations of Mexican Americans. The drinking patterns and practices among Mexican Americans in Texas and California appear to differ significantly, with far fewer abstainers among Mexican Americans in California than among their Texas counterparts. Gilbert added, however, that this difference may be an artifact of different research designs in the two States.

Gilbert pointed out that the discrepancy between the proportion of male to female drinkers among Mexican Americans is greater than in the general population. An extraordinarily high number of Mexican American men die prematurely of alcohol-related causes, and the persistence of high rates of heavy drinking and problems among men age 30 and beyond suggests that drinking may be integrated into male development differently among Hispanics than in the general population. Gilbert's comparison of three successive generations of Mexican Americans indicates a distinct increase in drinking frequency among Mexican American men and more subtle differences among Mexican American women. Her findings show that with succeeding generations Mexican Americans become more like the general U.S. population in their drinking habits.

M. Audrey Burnam described her findings from a Los Angeles community sample that compared prevalence of alcohol disorders in Mexican Americans and non-Hispanics. The study, part of the Epidemiologic Catchment Area Program, revealed a higher lifetime prevalance of alcohol disorders among Mexican American men than among non-Hispanic white men, particularly in the oldest age group. However, there were fewer reports of alcohol-related disorders among Mexican American women than among non-Hispanic white women. The ethnic difference among men was still evident after controlling statistically for age and education. Among women, however, the ethnic difference was insignificant when adjusted for education. Among persons who met the DSM-III criteria for alcohol abuse or dependence, few ethnic differences were found in the type of alcohol diagnosis reported, the number of different alcohol problems, and the distribution of alcohol problems. On the average, Mexican American women experienced a later age of onset of alcohol abuse or dependence and a shorter duration of alcohol problems than non-Hispanic white women and men of either ethnic group. The data suggest Mexican American women may be more influenced by attitudes that discourage heavier drinking styles, thus lowering the frequency of alcohol problems and delaying the average age of onset among those who ultimately develop problems.

Andrew Gordon noted that the literature on Caribbean Hispanics, comprising Cubans, Dominicans, and Puerto Ricans, shows that there are differences among these subgroups in drinking patterns and alcohol-related problems and that all of them differ distinctly from Mexican Americans. In contrast to Mexican Americans, Puerto Ricans began immigrating in significant numbers after World War II, and most Cuban and Dominican Hispanics began arriving in the

1960s. Perhaps because of their more recent arrival, a high proportion of Caribbean Hispanics have maintained drinking practices such as fiestas or weekend binges from their country of origin.

Glorisa Canino described the large-scale psychiatric epidemiologic study she and her colleagues conducted in Puerto Rico with a random sample of the adult population. They found that alcoholism is highly prevalent, especially among men. The lifetime prevalence of alcoholism was 13 percent and the current (6-month) prevalence was approximately 5 percent, as measured by the Diagnostic Interview Schedule. Other estimates have ranged from 9 to 40 percent, depending on the definition of alcoholism, the data sources, and the time of data collection. Methods used in the Canino et al. study were similar to those used in the Epidemiologic Catchment Area studies and results reflect the findings reported by Burnam concerning the Hispanic sample in the Los Angeles ECA study. The number of adults 18 through 64 years of age who meet the criteria for current alcohol abuse or dependence in Puerto Rico was estimated at nearly 100,000.

Alcohol-Related Morbidity, Mortality, and Social Consequences

Current national mortality data are not available for Hispanics, mainly because ethnicity information is not collected by most States, or when it is, it is not recorded in a uniform manner on death certificates. Thus it has not been possible to examine alcohol-related mortality among U.S. Hispanics. However, morbidity data indicate that alcohol plays a key role in the incidence of certain diseases. Alcohol is a risk factor for cancer of the oral cavity-pharynx, esophagus, liver, and larynx. National Cancer Institute data show that Puerto Ricans are at particularly high risk for cancer at two of these sites—oral cavity-pharynx and esophagus—and at elevated risk along with other minorities for liver cancer. In fact, the highest U.S. rates for esophageal cancer were found among blacks and Puerto Ricans. The rate of laryngeal cancer among Puerto Rican males was nearly double that among Hispanics in New Mexico. Five-year survival rates indicate a uniformly poor prognosis for cancer of the esophagus among all minority groups, and only Hispanics in New Mexico (and blacks and whites) had any survivors after 5 years

Richard Goodman presented one of the few studies that have examined the association between alcohol and homicide in relation to race and ethnicity. Goodman and his colleagues used data from the Los Angeles Police Department and the medical examiner's office to study criminal homicide cases in that city over a 10-year period in the 1970s. Alcohol was detected in the blood of nearly one-half of the 3,500 victims aged 15 through 64 who were tested. Nearly one-third of those tested had blood alcohol above the legal intoxication level. Blood alcohol was more prevalent among Hispanic homicide victims than among black or non-Hispanic white victims. Variations in blood alcohol levels among the different racial or ethnic groups were related to situational variables such as day of the week and the location of the homicide, as well as to the relationship of the victim and the perpetrator. These findings reveal the importance of evaluating the roles of alcohol use, race, and ethnicity as risk factors for interpersonal violence.

American Indians and Alaska Natives

Drinking Patterns and Prevalance of Alcohol Problems

American Indians number about 1.5 million and constitute less than 1 percent of the U.S. population. Although they have lived in North America for thousands of years, Indians are now a small minority, concentrated in a few geographic areas. Some 280 separate tribal entities are recognized by the Federal Government. Alaska Natives consist of 22 different ethnic groups residing in about 250 geographically dispersed villages across Alaska.

In his presentation to the conference, Dwight Heath discussed the lack of baseline epidemiologic data on alcohol problems among American Indians. This is because previous surveys, based on probability samples, have been too small to yield meaningful information. Nonetheless, ethnographic and community studies have shown that alcohol abuse among American Indians is considered a major social, economic, and health problem. Heath noted that while these studies are often rich in anecdotal detail, few of them present much quantitative data on amount, frequency, and variability of alcohol consumption.

Overall, the published literature indicates that the rates of alcohol abuse and alcoholism are several times higher among American Indians than the general population, although abstinence is practiced by a high percentage of Indian women and by some entire tribes. Indian men between the ages of 25 and 44 have the highest rate of alcohol consumption. Alcohol problems among Indians appear to be strongly associated with economic factors such as unemployment, poverty, and marital and family instability.

Among Indian women who drink, the rates of heavy drinking are high, and an extremely high incidence of fetal alcohol syndrome has been reported in some Indian groups. Although Indian women generally consume less alcohol than Indian men (with the notable exception of Sioux women), they account for nearly half of all Indian cirrhosis deaths. The death rate from cirrhosis among Indian women is more than triple the rate for black women and is about six times greater than the rate for white women.

Much less is known about drinking patterns and problems among Alaska Natives. Very few alcohol studies have examined Native Alaskans apart from the general population of that State, which itself has traditionally received little attention from alcohol epidemiologists despite high overall rates of alcohol abuse and alcoholism. An analysis of self-reported consumption in a clinical sample of Anchorage residents showed that the average daily consumption of alcohol by Native Alaskan males and females was lower than for non-Native Alaskans. However, a number of studies examining social indicators of alcohol problems in Alaska, such as hospital admissions, accident records, arrest records, and suicide rates, have found a disproportionately high rate of alcohol-related disorders in the Native population.

In their sociocultural and epidemiologic review of the literature on Alaska Natives and alcohol, Dennis Kelso and William DuBay noted that alcohol has dominated the political relationships between the government and indigenous communities since the European colonization of North America.

Throughout North America, traders used alcohol as a means of doing business and gaining political allies among native people. Although many indigenous people rejected alcohol from the earliest times, others came to view it as a rare prize to be consumed quickly and entirely whenever possible, thus establishing a binge drinking pattern that is observable to this day.

Although a binge drinking pattern in some Indian groups has been well documented, several speakers at the conference observed that variation among local Indian populations is so great that any broad generalization is suspect. Joan Weibel-Orlando noted in her review of the literature on urban and rural Indian drinking patterns that prohibition enforced until the 1950s on Alaska Natives and American Indians may have been the genesis of the binge drinking style, which has taken a toll on the overall health and well-being of both groups. The drinking party, during which alcoholic beverages are consumed rapidly until the supply is exhausted and the participants pass out, has had similar effects.

The American Indian population, formerly restricted almost entirely to reservations, is now nearly evenly divided between urban areas and reservations. Studies have shown that this demographic shift, in progress for several years, has produced general differences in drinking patterns between rural and urban Indians who drink. Recent research by Weibel-Orlando and others shows that the binge drinking style is still prevalent among Indians who live on reservations and in other rural areas. Weibel-Orlando found that while Indians who engage in sporadic bouts of very heavy drinking can also be found in urban areas, a large majority of urban Indians who drink tend to do so fairly heavily and regularly, a drinking pattern sometimes called "maintenance drinking." Although the consequences of prodigious alcohol consumption at rural Indian binge drinking parties—accidents, homicides, and child and spouse abuse—have been well documented epidemiologically, Weibel-Orlando pointed out that there are long-term health hazards in the maintenance drinking style more prevalent among urban Indian drinkers and that longitudinal studies to assess these hazards are warranted.

A few psychiatric epidemiologic studies have explored the relationships among alcohol use, affective disorders such as depression, and related epidemiologic factors among American Indians. Spero Manson presented a systematic investigation of alcoholism, depression, and possible sociodemographic correlates among American Indians using standardized psychiatric instruments. Study results from Manson and colleagues suggest that (1) the lifetime version of the Schedule for Affective Disorders and Schizophrenia (SADS-L) and the NIMH Diagnostic Interview Schedule (modified to reflect Indian cultural norms) can be reliably administered among American Indians; (2) the SADS-L can be used with other alcohol inventories to develop more clinically meaningful interpretations of alcohol abuse; and (3) alcohol and depression symptoms do not vary significantly with age or years of formal education, marital status, or tribal affiliation. Interestingly, comparisons of three distinct and geographically separated Indian tribal cultures (Pueblo, Pacific Northwest, and Plains) revealed virtually no difference in alcoholism profiles by sex or study site, suggesting that the degree of impairment and extensive drinking histories common to alcohol-dependent individuals outweigh gender and cultural differences.

Alcohol Use Among Indian Youth

Indian youth appear to be at particularly high risk for heavy drinking and alcohol-related problems. Epidemiologic data on Indians generally are scarce, and prevalence data collected over time are even more rare. However, a 10-year survey of alcohol and drug use among Indians provides insight into the patterns of alcohol and drug use among Indian reservation youth. The survey findings, based on systematic study of geographically, culturally, and socioeconomically diverse Indian groups, were presented to the conference by the investigators, E.R. Oetting and Fred Beauvais. Lifetime prevalence of alcohol use was higher among Indian youth than among non-Indian youth, although alcohol is less available on reservations. The data showed a steady increase in the lifetime use of alcohol among youth over the past decade.

In 1982, approximately one-half of Indian youth in grades 7 through 12 had used alcohol in the 2 months preceding data collection, compared with just over one-fourth of non-Indian youth included in the National Household Survey. Even more striking was the finding that nearly 40 percent of the 12-year-old Indian youth had used alcohol in the previous month, and 8 percent had used it on multiple occasions. In comparison with their non-Indian counterparts, a greater percentage of Indians in the 8th and 12th grades had gotten drunk in the prior month. Indian youth in the 12th grade were also more likely to have gotten drunk on multiple occasions. Finally, Indian youth had gotten drunk for the first time at about the same age as non-Indians, but once they started drinking they tended to get drunk more often.

These differences between Indians and non-Indians might be even more pronounced if school dropouts were included, because dropping out of school is generally associated with higher alcohol use. Other study findings suggest that youth who like school, succeed in their studies, and have families with better income and educational levels are somewhat less likely to get involved with alcohol. The research suggested that peer and family relationships are critical in shaping adolescent drinking behavior.

Alcohol-Related Morbidity and Mortality

In his review of the literature on American Indians and alcohol, Heath cited Indian Health Service data suggesting that alcohol is a direct contributor in 4 of 10 leading causes of death among American Indians: accidents, liver disease, homicide, and suicide. For many years accidents were the leading cause of death among Indian males, but now they are the leading cause of death among Indians of both sexes. Chronic liver disease, the eighth leading cause of death in the general U.S. population, is the fourth leading cause of death among Indians. The death rate from liver cirrhosis among Indian women is more than triple the rate among black women and about six times that of white women. Homicide, the seventh leading cause of Indian deaths, occurs at a rate more than double that of the U.S. population. Suicide among American Indians is nearly twice the overall U.S. age-adjusted rate and is higher than that of other nonwhite minorities. Furthermore, hospitalization for alcohol-related illnesses or injuries is three times more frequent among Indians than for the general population. It is important to note, however, that these are overall figures and that morbidity and mortality from cirrhosis and other alcohol-related problems vary greatly by tribe. For example, the Hopi have a high cirrhosis death rate, while the neighboring Navaho have a rate even lower than the national rate.

Mary Dufour and colleagues presented data on the differential vulnerability of various racial and ethnic groups to alcohol-related mortality based on analyses of multiple cause of death statistics for 1980 maintained by the National Center for Health Statistics. Using a recently developed measure, years of potential life lost (YPLL), these investigators noted that the average YPLL/death from alcoholic liver disease reached a high of 22 years for Native American females compared to 10 years for Japanese males. Racial/ethnic variations in YPLL/death tended to be even more dramatic for indirect causes of death (e.g., motor vehicle accidents, suicides, homicides).

Outcome of Alcoholism Treatment in Indians

Published studies on alcoholism treatment outcome in American Indians are scarce, largely because few alcohol treatment programs for Indians perform any evaluation of treatment effectiveness. R. Dale Walker cited as an example a recent study of alcohol treatment programs for Indians in which it was found that only 8 percent performed any such evaluation in 1983. Walker and his colleagues described their own research on uses of treatment services, treatment outcome, and recidivism in urban Indians. In this study, part of the Seattle Treatment Outcome Project, Indian population samples were drawn from detoxification centers, inpatient halfway houses, and outpatient alcoholism treatment settings. The findings were discouraging. They indicated a high prevalence of alcohol-related problems in urban Indians of the Northwest and a low frequency of successful treatment outcome as well as a high recidivism rate, despite extensive time in treatment for most subjects. The authors concluded that the time has come for a broadly based national demonstration project to develop a systematic approach to studying and treating alcohol problems in American Indians. Many conference participants agreed that collaboration between NIAAA and the Indian Health Service would be essential for the success of such a program.

Asian/Pacific Americans

Drinking Patterns and Prevalence of Alcohol Problems

According to the 1980 census, Asian Americans and Pacific Islanders numbered more than 3.7 million and constituted one of the fastest growing ethnic groups in the United States. Although they are often classified together in national surveys, the subgroups in this ethnic category differ widely in culture, language, attitudes, and immigration patterns.

Overall, much less is known about alcohol patterns and problems among Asian/Pacific Americans than any other major minority group, and only the largest of these populations--Japanese, Chinese, and Filipinos--have received much scientific attention. Hardly any studies have been done on smaller Asian/ Pacific Island subgroups such as Tongans and Samoans.

Despite their diversity, several generalizations commonly prevail concerning Asian/Pacific Americans and alcohol. One belief is that Asian Americans are predominantly nondrinkers and experience few alcohol problems. Another is that the various subgroups of Asian/Pacific Americans have similar drinking practices and similar levels of alcohol problems. However, a recent Los Angeles survey found significant differences in drinking patterns of Asian subgroups by sex, age, place of birth, and personal drinking attitudes. The survey, presented to the conference by Harry Kitano, found that Japanese and Chinese Americans had a higher proportion of drinkers than abstainers, but the opposite was found among Koreans and Filipinos. Except among the Japanese, an overwhelming majority of abstainers were female. Heavy drinking, mainly among males, was noted in each of the Asian groups, with the greatest amount of heavy drinking among the Japanese and the lowest among the Chinese. Five independent variables--drinking consequences, sex, motives for drinking, drinking attitudes, and age--accounted for 43 percent of the variance in alcohol consumption levels, making these characteristics relatively strong predictors of drinking patterns in these populations.

Chinese Americans are the largest Asian American minority group. For more than a decade, most published studies on alcohol use and abuse among Chinese and other Asian Americans have been based on data from clinical cases or relatively small community samples. More recently, epidemiologic data collected in the United States, Taiwan, and China have made important contributions to our understanding of the prevalence of alcohol abuse and dependence among Chinese Americans. Findings on this project were presented to the conference by Elena Yu. Like the results of other recent research, the data presented by Yu indicate that Chinese Americans have a higher proportion of abstainers than other minority groups. However, based on administration of a modified version of the Diagnostic Interview Schedule (DIS), Yu also reported considerable variations in the rates of alcohol abuse and dependence among Chinese living in the United States, Taiwan, and Shanghai. While the rates of alcohol abuse and dependence in Taiwan were much lower than those reported in the United States, they were considerably higher than those found in Shanghai. Yu suggested that drinking as a way of coping with stress and modernization might account for the differing rates of problem drinking among young adults in Shanghai, Taiwan, and the United States.

Alcohol consumption patterns among various groups in the ethnically diverse State of Hawaii were the subject of Frank Ahern's presentation. The four largest ethnic groups in Hawaii are Caucasians, Japanese, Native Hawaiians (a category that includes Part-Hawaiians and unmixed Hawaiians), and Filipinos. There are smaller numbers of other groups such as Koreans, Samoans, and Portuguese, in addition to persons of mixed ancestry. Adding to the complex nature of the

Hawaiian population is the influx of immigrants from foreign countries, the immigration of Caucasians from the U.S. mainland, and the transitory presence of tourists and military personnel.

Ahern said the unique population mix in Hawaii raises a host of methodological and analytical issues to be considered in studying alcohol use, alcohol abuse, and alcoholism among racial and ethnic groups. It is possible that different groups attach different meanings to alcohol-related behaviors or drinking problems. There is agreement among a number of studies that the rate of alcohol problems among Native Hawaiians is higher than for any other group on the Islands with the exception of Caucasians. The apparent high proportions of alcohol abuse among Native Hawaiians suggest that they warrant more intensive epidemiologic study.

Sharon Murakami presented the findings of a statewide epidemiologic survey conducted by the Hawaii Department of Public Health. This survey indicated that Caucasians and Native Hawaiians do not differ significantly in their current use of alcohol, although they consume more than Japanese, Chinese, and Filipinos. The Chinese and Filipinos rank lowest on most estimates of drinking prevalence and abuse and the Japanese fall in between. These studies also show that alcohol use is far less frequent among females than among males. Information on alcohol-related behavior among Hawaii's smaller ethnic groups, new immigrants, and persons of mixed ancestry is virtually nonexistent. Murakami reported that Native Hawaiians and Caucasians seem to experience similar psychosocial problems and cognitive or physical symptoms induced by alcohol. However, Native Hawaiians have the highest risk of alcohol abuse based on the extent of their drinking and on the results of a statewide epidemiologic survey showing that they are less inclined to seek professional help.

These ethnic differences in drinking practices were confirmed by interview data collected by Loïc Le Marchand and his colleagues between 1975 and 1980 from a large representative sample of Hawaii's population. In their report to the conference the investigators said that Native Hawaiians had the highest consumption of beer and that Caucasians had the highest consumption of wine and spirits. Total ethanol consumption was comparable between Caucasians and Native Hawaiians, and consumption by these two groups was considerably greater than that reported for Japanese, Chinese, and Filipinos. This pattern, established by studies of either daily or lifetime use of alcohol, was fairly consistent across sex and age groups. Correlations of these consumption data with race-specific incidence of cancer showed that alcohol consumption patterns in Hawaii adequately explained the ethnic variation in the incidence of oropharyngeal cancer but not esophageal cancer. The discrepancy seems due to the relatively low risk of esophageal cancer among Caucasians and does not appear to be based on differences in other known risk factors for esophageal cancer, such as smoking or low consumption of fruits and vegetables.

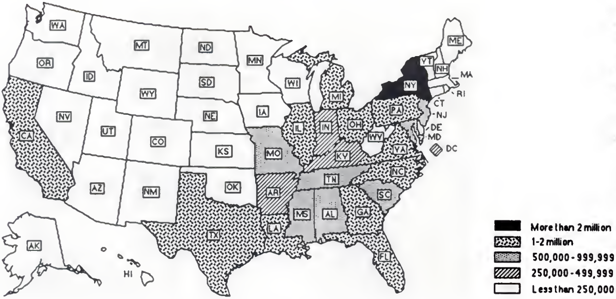
The Alcohol Flushing Reaction

Much attention has been focused recently on the flushing reaction, a genetically based physiological response to alcohol that is uncommon among Caucasoid peoples but is prevalent among Mongoloid peoples. Because the flushing reaction is unpleasant, it has been hypothesized that the reaction is a deterrent to excessive drinking and thus is an important factor in the lower alcoholism rates among Chinese, Japanese, and other Asian populations in which the responsible gene is highly prevalent. Ronald Johnson, in his review of research in this area, noted that the association between this reaction and lower alcohol consumption, though positive, is very weak and tends to occur only under certain conditions. For example, flushing is common among Koreans, who have a high rate of abstention overall, yet Koreans who do drink are frequently heavy drinkers. Johnson also pointed out that the reaction is very common among people with remote Asian ancestry, including American Indians, Eskimos, and Aleuts. These groups share the same genetic base with Asians, yet heavy alcohol consumption is not at all uncommon in these populations. These considerations led Johnson to suggest that the flushing reaction may afford some protection only in relatively intact cultures with traditions of normative alcohol use. Furthermore, research by Johnson has demonstrated that there are differences among susceptible individuals in the amount of alcohol required to produce the reaction and that the limited protective effect is seen only among those who flush after one drink or less.

I.

Alcohol Use Among Black Americans

The Black Population: 1980



Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1986* (106th edition) Washington, D.C., 1985.

Selected Social and Economic Characteristics of the Black Population: 1985

	Total	Percent
Population	28,151,000	100.0
Under 15 years old	7,917,000	28.1
15-44 years old	13,590,000	48.3
45-64 years old	4,406,000	15.7
65 years old and over	2,238,000	7.9
Years of school completed		
Persons 25 years old and over	14,820,000	100.0
Elementary: 0-8 years	3,113,000	21.0
High school: 1-3 years	2,851,000	19.2
4 years or more	5,027,000	33.9
College: 1-3 years	2,188,000	14.8
4 years or more	1,640,000	11.1
Labor force status		
Civilians 16 years old and over	19,664,000	100.0
In civilian labor force	12,364,000	62.9
Employed	10,501,000	53.4
Unemployed	1,864,000	9.5
Unemployment rate*	—	15.1
Total families	6,778	100.0
Married couples	3,469	51.2
Female householders†	2,964	43.7
Male householders†	344	5.1
Median family income, 1984	$15,432	na‡
Persons below poverty level, 1984	9,490	33.8

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1987* (107th edition) Washington, D.C., 1986.

* Total unemployment as percent of civilian labor force † With no spouse present ‡ not applicable

The Epidemiology of Drinking Patterns and Alcohol-Related Problems Among U.S. Blacks

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ABSTRACT

This paper examines the literature on blacks and alcohol use in the post-World War II period. Areas covered in the review include epidemiological, clinical, social survey, and ethnographic findings. The focus of the review is on the prevalence and patterns of alcohol-related problems and alcohol consumption. In the area of alcohol-related problems, several areas of research are discussed. First, epidemiological trends on liver cirrhosis and esophageal cancer morbidity and mortality are explored. Second, indicators of psychosocial/behavioral problems such as arrests for public drunkenness, arrests for drinking and driving, and hospital admissions statistics are examined. Third, self-reported social problems related to alcohol use from surveys of the general population are described.

The discussion of drinking patterns reviews the findings from both ethnographic and survey studies. Recent findings from a national survey of black and Hispanic drinking patterns are highlighted. This part of the paper focuses on the sociodemographic correlates of drinking patterns and problems in a large sample of black men and women. The final section of the paper compares and contrasts findings about alcohol consumption and alcohol-related problems described in the literature. Areas of agreement and disagreement, including reasons for any conflicting findings, are explored and discussed. Based on this discussion, gaps in the literature and the needs for future research on blacks and alcohol are identified.

Introduction

Historical Background: From Black Temperance to Alcoholization, 1830-1930

> . . . being mercifully redeemed from human slavery, we do pledge ourselves never to be brought into the slavery of the bottle, therefore we will not drink the drunkard's drink: whiskey, gin, beer, nor rum nor anything that makes drunk come.
>
> (American Temperance Union, p. 4)

Blacks of the early 19th century appeared to be characterized by strong support for the American temperance movement and unusually low rates of alcohol-related problems. The temperance movement had special appeal for blacks due to its close political connection with antislavery reform. Abstinence was regarded as a means of support for emancipation and equality. Blacks were inspired to develop a full-blown "Colored Temperance Movement" and to support temperance issues through the press and numerous religious and self-betterment organizations (Quarles 1969; Cheagle 1969; Herd 1985*b*).

After the Civil War and emancipation of slaves, blacks continued to promote temperance through the church, the "colored" women's club movement, and temperance societies such as the Women's Christian Temperance Union, the Sons of Temperance, the Friends of Temperance, and the Independent Order of Good Templars (Meir 1964; Sellers 1943; Whitener 1945).

Throughout the 19th century, rates of drunkenness and problems due to drinking seemed to be comparatively low among blacks. John Koren's (1899) exhaustive analysis on the "Relations of the Negroes to the Liquor Problem" pointed to the medical consensus which had long held that "alcoholism or delirium tremens, mortality from alcoholic diseases, and dipsomania occur less frequently among the blacks than among the whites" (pp. 181-182). Making a similar point, Brinton (1891) argued that blacks were not as prone to acute alcoholism as whites due to the "inferior susceptibility (of the blacks') nervous system" (p. 429). These conclusions are supported by the 1880 U.S. mortality statistics, which reported that for alcoholism:

> the proportion in those parts of the country in which the color distinction is made is much greater among whites than among the colored, the figures being for the Irish 6.7, for the Germans 2.7, for the whites 2.5, and for the colored 0.7 per 1,000 deaths from known causes. A large proportion of the deaths reported due to alcoholism occur in connection with delirium tremens, and this form of disease is rare in the colored race.
>
> (U.S. Census Office 1880, p. lxvii)

By the early 20th century, black participation in the temperance movement had declined. The temperance movement in the South had become extremely racist and openly supported the policies of white supremacy, including Jim Crow laws and black political disfranchisement (Herd 1983). The press circulated articles asserting that blacks were liquor crazed, violent, and sexually depraved (Herd 1983). In response, most black leaders withdrew support from the prohibition movement and began to agitate for voting rights and black social equality (Herd 1985*c*).

These shifts in the prohibition movement coincided with major demographic changes in the black population. Beginning around 1900, a massive wave of migration from the rural South to the urban centers of the North occurred in the black population (Gwinnell 1928). In the reception cities of New York, Detroit, Chicago, and Cleveland, blacks quickly became a focus of the nightlife and heavy-drinking subcultures. Liquor flowed freely, and blacks were closely identified with the illegal liquor traffic, both as small-time manufacturers and retailers and as heavy consumers. Blacks turned to running bootlegging operations, throwing liquor parties, and operating speakeasies, as a means of economic support, especially during the Depression years (Winston and Butler 1943; Larkins 1965). Blacks also became a prime market for illegal alcohol sold by white liquor traders (Drake and Cayton 1945; McKay 1968).

Increasing urbanization and alcohol use in black communities led to abrupt increases in alcohol-related problems. An analysis from 1928 noted:

> From the year 1918 the death rate per 100,000 from alcoholism has steadily increased among Negro policy-holders. And since 1911, only one year, that of 1917 (a war year), was the rate higher than for the year 1927. In the past two years the rate increased from 4.12 to 5.3, while the rate for white policy-holders declined from 3.1 to 1.8 per 100,000.
>
> (Carter 1928, p. 360)

Similarly, Malzberg (1944) reported that black rates of hospital admissions for alcoholic psychoses in the State of New York between 1929-1931 greatly outstripped rates in the white population:

> Average annual standardized rates of first admissions with alcoholic psychosis were 22.2 per 100,000 Negroes and 6.5 for the white population, the former being in excess in the ratio of 3.4 to 1, an excess of 240 percent.
>
> (Malzberg 1944, p. 28)

The changes initiated during this period set the trend for subsequent decades as blacks became increasingly urbanized, and alcohol use gained a major foothold in social and economic life.

Indicators of Alcohol Problems Among Contemporary U.S. Blacks

The following review examines black drinking patterns and alcohol-related problems as they emerged since the repeal of Prohibition in 1933. The focus of the review is on changes in various medical and psychosocial indicators of alcohol problems among blacks from roughly the 1950s through the 1980s. Chronic diseases (such as cirrhosis of the liver and esophageal cancer) are the primary focus of the discussion on medical consequences. The review of psychosocial indicators focuses on two major areas: (1) alcohol treatment and alcohol-related arrest statistics from official records, and (2) social problems related to alcohol use at the personal, familial, and community level.

The various types of alcohol-related problems represented in these indicators may involve different patterns of alcohol consumption and interaction with different sets of normative values and social conditions. Acute medical consequences such as alcohol overdoses or drownings are often related to "binge drinking"–rapid, high quantity alcohol consumption–in combination with hazardous environmental conditions. In contrast, physiological diseases such as cirrhosis of the liver are principally the result of heavy long-term alcohol consumption, whether or not it is accompanied by overt intoxication or untoward social consequences.

Psychosocial indicators of alcohol problems are affected not only by drinking patterns, but also by prevailing family and community norms and attitudes towards the effects of alcohol. Hence, personal and family problems attributed to drinking, such as divorce and job troubles, may be directly influenced by social expectations about drinking (e.g., tolerance for drunkenness) held by family and friends. Rates based on official statistics such as arrests for public drunkenness and/or drunk driving are often affected by law enforcement practices and legal norms. Similarly, treatment statistics for alcohol problems reflect familial and community norms, as well as institutional practices within the society.

Black drinking patterns are analyzed to determine how patterns of alcohol consumption (e.g., quantity and frequency) and normative values toward alcohol use may affect rates of alcohol problems. Variations in drinking patterns among gender, class, age, regional, and religious groups within the black population are examined to ascertain which groups are at highest risk for alcohol-related problems. Based on this analysis of alcohol problem indicators and drinking patterns, key problem areas are identified and implications for further research are discussed.

Alcohol-Related Medical Problems

Cirrhosis of the Liver

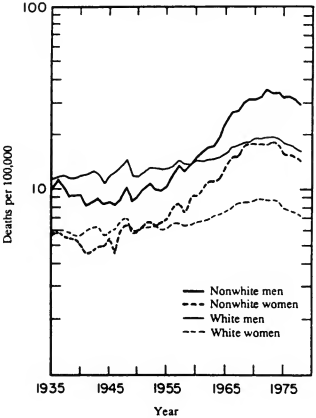
Prior to the mid-1950s, age-adjusted rates of liver cirrhosis mortality in the nonwhite population were generally lower than rates in the white population (figure 1). This trend rapidly changed after 1955. In the 10-year span from 1960 to 1970, the cirrhosis mortality rate of the nonwhite population doubled, increasing from 11.9 to 23.8 deaths per 100,000 persons. For the entire period between 1950 and 1973, nonwhite rates increased about 200 percent, while rates among whites rose about 60 percent.

Mortality rates are based on data from death certificates and on population data collected by the U.S. census. It is well known that both of these data sources are biased in recording information for nonwhites. However, a number of factors suggest that the time trend data we are looking at says something "real" about changes in the relative incidence of mortality between the races. First, several studies suggest that, in general, physicians' practices of recording cirrhosis deaths on death certificates have remained stable over time (Speizer et al. 1977; Kramer et al. 1968). Second, census coverage of the nonwhite population has improved substantially in the past several decades (Siegel 1974); hence, black rates have been increasing disproportionately even while the population base has been growing. Third, the increase in mortality is not sporadic, but is highly patterned by geographic region, occurring primarily in areas that have had consistently accurate reporting of cirrhosis mortality rates for several decades. Finally, clinical and epidemiological studies indicate that increasing numbers of blacks are experiencing chronic diseases related to long-term heavy alcohol consumption (Ernster et al. 1979; Pottern et al. 1981; Rogers et al. 1982).

Cirrhosis statistics used in this analysis are based on the "nonwhite" classification used to designate racial groups other than Caucasians in U.S. mortality reports and population tables. Nonwhite rates provide a rough estimation of black cirrhosis mortality, since blacks accounted for about 92 percent of the U.S. nonwhite population during most of the years covered by this analysis (MacMahon and Pugh 1970). In the analysis of cirrhosis rates by selected geographical areas, regions that have large nonblack minorities, such as the Pacific and Mountain States, are excluded to provide a more accurate portrait of trends in black rates.

Since 1973, cirrhosis rates among both whites and nonwhites have declined slightly, but rates among black Americans are still disproportionately high (Herd 1985*b*). According to a recent report, nonwhite males in the 25-34 year age bracket who reside in seven major cities are 10 times more likely than whites to die of liver cirrhosis; and for all ages, the cirrhosis mortality rate for blacks is almost twice as high as the rate for whites (DeLuca 1981). In 1979, the age-adjusted cirrhosis mortality rate for nonwhites was 21.1 per 100,000 population, compared with 11.1 per 100,000 for whites.

Figure 1. Age-adjusted death rates for liver cirrhosis by color and sex, 1935-1978



Source: Herd (1985*b*).

Sex Differences in Cirrhosis Rates

The recent increase in nonwhite age-adjusted cirrhosis mortality rates has been equally dramatic for both males and females. Between 1950 and 1973, the increase in mortality for nonwhite males was 276 percent versus 66 percent for white males. Over the same period, cirrhosis rates for nonwhite females increased by 205 percent, versus 54 percent for white females.

Age-specific mortality rates. In recent years, a greater proportion of nonwhites than whites died at younger ages of cirrhosis. In 1975, cirrhosis deaths for nonwhite men reached their peak at ages 55-64, while mortality for white males peaked in the 65-74 year age group (figure 2). On the whole, females exhibited higher cirrhosis rates at younger ages than males, but again nonwhite female rates peaked at earlier ages than rates for whites. The highest rate of cirrhosis occurred in the 45-54 age range for nonwhite females, compared with 55-64 for white females.

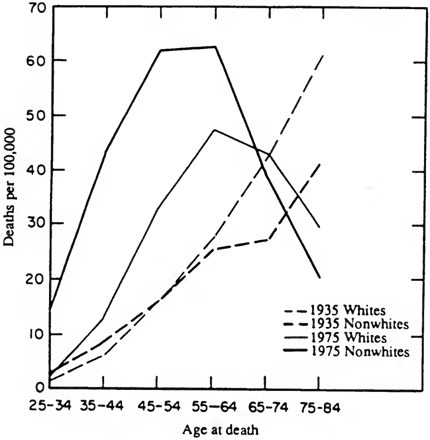
In the older age groups, nonwhites exhibited lower cirrhosis death rates than whites. White men over 65 years old appear to be at considerably greater risk than nonwhites of dying of cirrhosis. For women, nonwhites over 75 are less likely than whites to die of cirrhosis.

Cohort effects. The contemporary age distribution of cirrhosis mortality in whites and nonwhites is shaped to a large extent by cohort effects in the wake of the enactment and subsequent repeal of Prohibition. Persons maturing during the turn-of-the-century temperance and prohibition movement exhibited lower mortality rates than cohorts who came of age before or after this time (figures 3 and 4). Hence, the cirrhosis mortality rate of each successive cohort born from 1865 through 1895 was lower than the previous one.

This trend reversed in cohorts born after 1900, and their mortality rates increased sharply. Cohorts of 1920 and 1930 showed particularly high increases. Recent studies suggest that this upward trend is slowing, based on the minimal increases and even slight drop in mortality experienced by the cohorts born between 1935 and 1944.

Cohort effects are much more dramatic for nonwhites than for whites. Blacks born during the 19th century through about 1904 exhibited lower cirrhosis mortality rates than whites. By the cohort of 1910, which reached maturity in the 1920s and 1930s, this pattern had shifted, and nonwhite death rates began to

Figure 2. Age-specific death rates for liver cirrhosis among white and nonwhite 10-year age groups, 1935 and 1975



Source: Herd (1985*b*).

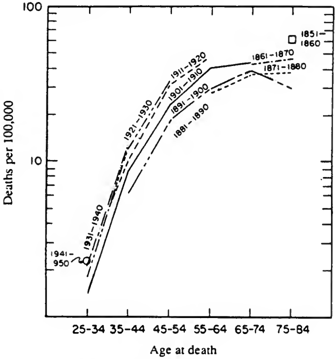
outstrip white death rates. With each successive cohort, the mortality level of nonwhite groups further surpassed the white population, contributing to the current excess of mortality among nonwhites. The lower current rate of cirrhosis mortality among older nonwhites is a reflection of these historical changes. The black elderly are members of cohorts born prior to 1910, which have been characterized by lower cirrhosis rates throughout their lifespan.

Regional differences. Between 1949 and 1970, the pattern of increase in nonwhite cirrhosis mortality rates varied greatly by geographical region (table 1). Age-adjusted rates rose to dramatic proportions in the Middle Atlantic, East North Central, and South Atlantic regions, while they remained low in the South Central regions. Thus in 1971, blacks in the North and coastal South were from two to four times more likely than blacks in the deep South to die of cirrhosis.

The geographical pattern of changes in the nonwhite population differs in important ways from the pattern observed for whites. Whereas black rates escalated dramatically in the Middle Atlantic and East North Central regions, they increased only slightly for whites. Mortality rates for whites rose more in the interior South than in the urban North. Among blacks, cirrhosis rates in the interior South were among the most stable and showed only modest increases between the 1950s and 1971. These differences in the pattern of change suggest that elevated rates among blacks in the North may be related to the largely migrant and heavily urbanized composition of the black population in these areas.

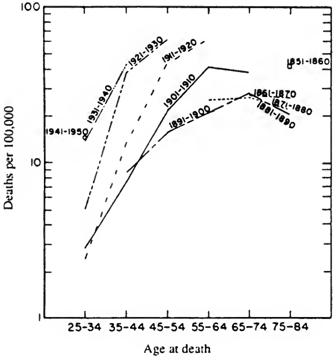
However, the South Atlantic region witnessed the greatest relative increase in cirrhosis mortality among both blacks and whites. The low rates in this region in 1949, which were similar to rates in the deep South,

Figure 3. Death rates for liver cirrhosis by age for white birth cohorts, United States, 1851-1950



Source: Herd (1985*b*).

Figure 4. Death rates for liver cirrhosis by age for nonwhite birth cohorts, United States, 1851-1950



Source: Herd (1985*b*).

Table 1.—Age-adjusted cirrhosis mortality rates by selected regions for whites and nonwhites, 1949-1971

Region	1949-1951		1959-1961		1969-1971		Percent change	
	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite
Middle Atlantic	10.5	11.7	12.2	22.7	15.3	40.2	46	243
East North Central	8.7	9.1	10.1	12.1	12.8	25.6	47	181
South Atlantic	7.6	5.7	8.5	8.6	12.6	21.2	66	272
East South Central	6.0	4.9	5.8	5.6	8.2	8.9	37	67
West South Central	6.7	5.3	7.4	6.8	10.8	10.9	62	105

Sources: U.S. Bureau of the Census (1964, 1973); U.S. Department of Health, Education, and Welfare (1959, 1963, 1973, 1974, 1975); U.S. National Office of Vital Statistics (1959).

rose to nearly the same level as rates in the East North Central region by 1971. The escalation of both white and nonwhite cirrhosis mortality in this area might be caused by increasing urbanization and the liberalization of attitudes towards alcohol use which have occurred since the 1950s.

Etiological factors in elevated nonwhite cirrhosis mortality rates. The problem of increasing nonwhite cirrhosis mortality is complex and seems to represent the interaction of several possible factors. First, recent studies show higher proportions of morbidity and mortality from *acute* liver diseases–fatty liver and alcoholic hepatitis–among nonwhites (Garagliano et al. 1979; Kuller et al. 1969). The excess in fatty liver and hepatitis occurs primarily in young adult males. Alcohol consumption is specified as the primary etiological agent for acute liver disease in these studies, although it is possible that other factors such as the elevated rate of hepatitis B virus among nonwhites (Alter 1983) could increase disease susceptibility (Hislop et al. 1981; Mills et al. 1979).

High rates of mortality from fatty liver and hepatitis probably contribute significantly to the steep increase in reported cases of liver cirrhosis deaths among young black males, given that true cirrhosis is rare in youthful populations. However, the increasing rates of acute liver disease among young males cannot account for the general increase in liver cirrhosis mortality among nonwhites, since it is the high rates of mortality in middle-aged and older adults which contribute most to overall death rates.

The high prevalence of mortality in the older age groups undoubtedly reflects the importance of a major factor in cirrhosis etiology–*lengthy duration* of heavy alcohol consumption. Clinical research by Lelbach (1975) indicates that the risk for cirrhosis is directly influenced by the number of years of heavy drinking. From a similar perspective, using aggregate statistical data, Skog (1980) points out that mortality outcome represents the cumulative effects of previous and current alcohol consumption levels.

The importance of *duration* of heavy consumption may provide insight into the disparity between white and nonwhite cirrhosis mortality despite the similar rates of heavy drinking reported for these groups in most surveys (Cahalan et al. 1969; Clark et al. 1982). A recent study by Caetano (1984) suggests that there may be differences in the stability of heavy drinking over the lifespan among black and white males. His analysis showed that for white men, frequent heavy drinking is most prevalent in young adults, but rapidly falls off as they reach their thirties. In contrast, among blacks, frequent heavy drinking is more common in men over 30, suggesting that it is a stable pattern of midlife. If so, this would increase the number of drinkers in the black population at risk for cirrhosis despite the similarity in the proportion of heavy drinkers in the two groups at a single point in time.

While provocative, Caetano's research leaves a major question unanswered. The differences in the age structure of heavy drinking described for the two groups could reflect either differences in the onset and socialization of drinking among contemporary blacks and whites or they could stem from historical differences, resulting in "cohort effects" which predispose blacks over age 30 to heavy drinking.

A recent analysis by Herd (1985*b*) focused on the importance of historical changes in black drinking patterns in explaining the dramatic "cohort effects" in black cirrhosis mortality. This work suggests that black attitudes towards alcohol use rapidly changed from traditional abstinence values held throughout the 19th century to an emphasis on heavy drinking lifestyles in the 1920s and 1930s. This period coincided with great waves of black migration to Northern urban areas. These social changes, along with continuing urbanization, appear to have led to increasing use of alcohol in the black community, making blacks more vulnerable to cirrhosis in the context of the general expansion of alcohol and drug use in American society in the 1960s and 1970s.

Esophageal Cancer

Incidence. The reported incidence of esophageal cancer among blacks is extraordinarily high. Between 1969 and 1971, black males in the 35-44 year age group had a incidence rate 10 times that of whites (table 2). Among the older age group, where the disease predominates, the rate among black males is still almost fourfold higher than that of whites. Although females of both races experience much lower rates of the disease, the gap between white and black women looms large. The rates among black women are from three to seven times higher than among white women.

Time trends/regional differences. Trends in mortality due to cancer of the esophagus share many similarities with the patterns observed in cirrhosis rates. In a cohort analysis of mortality during the period 1930 to 1967 (Schoenberg et al. 1971), the nonwhite population experienced steadily and rapidly

Table 2.–Esophageal cancer average annual incidence rates per 100,000 population

	White		Black	
Age group	Male	Female	Male	Female
35-44	0.5	0.4	5.3	2.7
45-54	4.2	1.2	30.7	9.0
55-64	14.9	4.6	58.8	13.9

Sources: Third National Cancer Survey 1969-1971; Ernster et al. (1979).

rising rates, while those of the white population remained relatively stable. The rising nonwhite mortality occurred at all ages and in all areas of the country and was more pronounced among males than females. When mortality rates were analyzed by U.S. geographical divisions for the 1940-1966 period, the highest rates for each race and sex were in the Northeast and the lowest were in the South. The geographical differential was more prominent for nonwhites (threefold) than for whites (twofold). Over time, the nonwhite population showed increasing rates in all divisions, but the most rapid increase was in the South.

A correlation analysis of mortality from 1950 to 1966 with urbanization based on cigarette and alcohol sales in 41 States in 1960 revealed that urbanization was the strongest predictor of mortality rates. It was concluded that migration may be a significant factor in the pattern of cancer deaths since "the rising mortality from esophageal cancer among nonwhites has paralleled the increasing proportion of nonwhites living in urban areas" (Schoenberg et al. 1971, p. 72).

More recent case-control studies argue that alcohol consumption may be a primary etiological agent in the development of esophageal cancer among blacks. Pottern et al. (1981) showed that the age-adjusted death rate for esophageal cancer in Washington, D.C., for nonwhite males in 1970-1975 was 28.6 per 100,000, exceeding the national level for nonwhite males by more than twofold and for white males by sevenfold. This study concluded that the major factor responsible for the excess in esophageal cancer death rates was alcoholic beverage consumption, with an estimated 81 percent of the esophageal cancers attributed to alcohol. The relative risk of esophageal cancer associated with use of alcoholic beverages was 6.4 (95 percent confidence interval: between 2.5 and 16.4.) Relative risk increased with the amount of ethanol consumed and was highest among drinkers of hard liquor, although the risk was also elevated among those drinkers who consumed only wine and/or beer. By contrast, the risk associated with cigarette smoking was 1.9 (1.0, 3.5) when controls with smoking-related causes of death were excluded, but declined to 1.5 (0.7, 3.0) when adjusted for ethanol consumption. It was noted that the "per capita 'apparent consumption' of alcoholic beverages on the basis of revenues for the District of Columbia surpasses the national level by nearly fourfold for hard liquor and about threefold for wine, although part of the excess is related to purchases by non-residents (Pottern et al. 1981, p. 781)."

A study of the increasing frequency of esophageal cancer among black male veterans in Baltimore (Rogers et al. 1982) also emphasized the role of alcohol as a major etiological factor. Heavy alcohol intake occurred more frequently in esophageal cancer patients than in control patients, and many of these patients experienced multiple alcohol-related complications.

Alcohol-Related Hospitalization and Treatment

Psychiatric Treatment

Since the 1930s, blacks in the urban North have been characterized by disproportionately high rates of psychiatric admissions for alcohol-related diagnoses (Malzberg 1944, 1960). The excess in black rates for alcoholic psychoses in New York in the 1930s and 1940s was attributed to high rates of urban migration, low social and economic status, and high rates of disease and social problems (Malzberg 1944). Between 1940 and 1950, black rates of hospital admissions for alcoholic psychoses in New York declined considerably, although they still exceeded rates among whites. The decline in rates was attributed to an overall improvement in the social and health status of New York blacks.

However, as late as the 1960s, blacks were still greatly overrepresented in psychiatric admissions for alcohol-related diagnoses in some States. In a study of 3,339 first admissions to public mental hospitals in Ohio from July 1958 to December 1961 (Locke and Duvall 1964), the rate for nonwhite males residing in metropolitan areas was more than double that of comparable whites (61.6 compared with 24.2 per 100,000 population). In a similar study of Maryland hospitals over a 3-year period ending in 1964 (Gorowitz et al. 1970), the rate for black men was approximately 1.5 times the rate for white men (656 compared with 43.3 per 100,000 population). Among females, there was an even greater gap between blacks and whites: the rate for black women was twice that for white women (219 versus 99 per 100,000 population).

An analysis of admissions for treatment of alcohol-withdrawal symptoms in a psychiatric hospital in Brooklyn, New York (Rosenblatt et al. 1971), revealed that black admissions were from 3.5 to 12 times higher than whites, depending on zone of residence. The following sociodemographic factors were significantly correlated with the rate of admissions in a zone: overcrowded housing; high rates of aid to dependent children, venereal disease, juvenile delinquency, tuberculosis, unemployment, and homicide; and low levels of education, income, and residential stability.

A nationwide survey (Meyer 1974) of admissions to State and county mental hospitals in 1972 also showed that admissions for alcohol disorders were higher for nonwhites (69.6 per 100,000 population) than whites (50.3 per 100,000 population). However, the same survey reported that the proportion of alcohol-related diagnosis (with respect to all psychiatric conditions) for nonwhites was slightly lower than that for whites, 22.7 versus 27.3 percent.

The latter finding was repeated in an analysis of mental hospital admissions for 1975. Blacks in State and county mental hospitals were more likely to be diagnosed as schizophrenics, while whites and Hispanics were more often diagnosed as having alcohol and drug disorders and depression. In other types of mental health facilities, the proportion of black admissions for alcohol and drug problems was lower than or similar to that for whites, except in outpatient psychiatric and private general hospitals, for which the percentage for blacks was considerably higher than for whites (American Public Health Association 1982).

In general, it appears that the disparity between black and white psychiatric admissions and institutionalization for alcohol-related disorders may have decreased by the mid-1970s. However, it is difficult to document this assumption given the lack of time-trend data on blacks at the regional level and national level. Further analysis of the change in population rates for psychiatric disorders and the change in the proportion of black alcohol-related diagnoses relative to other psychiatric disorders over time is needed before any firm conclusions can be drawn.

Treatment in Alcohol-Specific Agencies

The early 1970s witnessed the establishment of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) and the development of a wide range of alcohol-specific treatment agencies across the country. These agencies now constitute the primary institutional base for handling alcohol-related problems.

Recent large-scale surveys of alcohol and drug treatment agencies show that disproportionate numbers of blacks are being seen in alcohol treatment programs. One of the earliest evaluations of 44 NIAAA-funded Alcoholism Treatment Centers and special population programs showed greater percentages of black clients than would be expected in all program types (Towle 1974). Blacks were overrepresented in the Alcohol Treatment Centers by about 40 percent and only slightly overrepresented in the employee-based industrial alcohol programs. However, in the public inebriate and drinking driver programs, the proportion of blacks in treatment was 200 to 300 percent greater than their proportion in the U.S. population.

A survey of alcohol treatment programs for 1977-1980 (NIAAA 1982) showed that blacks constituted about 18 percent of the client population, although they constituted only about 11 percent of the U.S. population. Similarly, surveys which included both alcohol and combined alcohol and drug treatment programs reported that for 1980 and 1982 blacks made up 15 percent of the treatment population (NIAAA 1980, 1983). In 1982, over 44,000 blacks were seen in alcohol or combined alcohol and drug treatment programs. Population rates were over 50 percent higher for blacks than for whites, or 159.58 versus 101.15 per 100,000 population, respectively.

Table 3 presents the prevalence of blacks in alcohol treatment facilities by States for 1980 and 1982 (NIAAA 1980, 1983). It can be seen that blacks were overrepresented in nearly all States, but that the discrepancy was strongest in the Northeast (e.g., Ne

Table 3.—Percentage of black clients receiving treatment for alcoholism, selected States, 1980-1982

	1980		1982		Percent black in State population
State	All clients	Percent black	All clients	Percent black	
Alabama	2,411	33.8	1,632	28.2	25.6
Arkansas	3,336	24.2	1,750	26.2	16.3
California	65,853	8.0	37,542	11.1	7.7
Connecticut	4,000	15.4	3,185	19.0	7.0
Delaware	461	22.3	650	16.6	16.2
District of Columbia	2,244	79.0	2,708	87.0	70.3
Florida	8,998	15.8	11,008	15.8	13.8
Georgia	6,656	28.6	4,964	26.8	26.8
Illinois	8,115	16.0	8,722	22.2	14.6
Indiana	6,169	14.2	4,601	11.2	7.6
Kansas	2,635	8.4	2,878	7.4	5.3
Kentucky	4,244	13.2	2,378	7.8	7.1
Louisiana	4,089	35.9	6,088	37.8	29.4
Maryland	7,867	33.9	9,098	31.2	22.7
Massachusetts	11,422	9.4	15,905	6.9	3.8
Michigan	11,992	15.2	10,814	16.4	12.9
Mississippi	2,260	28.4	2,291	33.6	35.8
Missouri	4,173	21.1	2,088	14.8	10.4
New Jersey	3,945	22.8	6,675	23.6	12.6
New York	22,404	28.8	24,332	29.7	13.7
North Carolina	7,990	27.8	7,070	27.7	22.4
Ohio	8,419	13.4	9,649	14.1	10.0
Oklahoma	4,573	10.0	2,845	16.8	6.8
Pennsylvania	7,742	20.9	6,499	26.5	8.8
South Carolina	3,629	31.5	3,237	27.9	30.4
Tennessee	4,426	18.3	2,894	16.5	15.8
Texas	11,617	19.2	8,100	13.0	12.0
Virginia	8,804	22.6	6,390	24.6	18.9
Washington	6,980	6.2	8,823	5.6	2.3
West Virginia	1,481	8.8	1,814	8.4	3.0
National total (50 States and D.C.)	318,633	14.4	283,166	15.6	11.7

Sources: National Institute on Alcohol Abuse and Alcoholism (1980, 1983); U.S. Bureau of the Census, *Statistical Abstract of the United States* (1984).

York, Pennsylvania, New Jersey). Here the percentage of blacks in treatment was two to three times higher than their proportion of the populations in those states.

Table 4 demonstrates a similar pattern of regional differences in admissions to alcohol treatment units based on a 1983 survey of State alcohol and drug programs (National Association of State Alcohol and Drug Abuse Directors 1984). In the Northeast, admission rates for blacks greatly exceeded their percentage of the population, whereas in the South and Midwest, the rates were roughly similar to the proportion of the black population.

Table 4.–Alcohol client treatment admissions data for blacks, fiscal year 1983

State	All clients	Percent black	Percent black in State
Alabama	6,883	22.6	25.6
Arkansas	4,077	16.5	16.3
California	33,696	4.3	7.7
Connecticut	11,836	13.5	7.0
Delaware	5,073	26.7	16.2
District of Columbia	5,681	70.0	70.3
Florida	51,531	12.6	13.8
Georgia	26,664	25.4	26.8
Illinois	56,923	18.4	14.6
Kansas	14,943	7.4	5.3
Maryland	23,514	27.3	22.7
Massachusetts	64,422	7.1	3.8
Michigan	32,039	18.0	12.9
Mississippi	6,410	29.1	35.8
Missouri	14,839	15.0	10.4
New Jersey	15,364	28.5	12.6
New York	114,182	27.8	13.7
North Carolina	25,843	25.2	22.4
Ohio	18,779	17.7	10.0
Pennsylvania	41,660	28.3	8.8
South Carolina	18,459	24.4	30.4
Tennessee	4,990	13.8	15.8
Virginia	39,460	25.2	18.9
Washington	92,318	3.6	2.3
West Virginia	5,290	4.0	3.0
Total (38 States)	924,630	15.0	

Sources: National Association of State Alcohol and Drug Abuse Directors (1984); U.S. Bureau of the Census, *Statistical Abstract of the United States* (1984).

Age Distribution of Blacks in Alcoholism Treatment Settings

A number of studies in different treatment settings have reported that blacks in alcohol treatment are considerably younger than whites. An analysis of the characteristics of 2,831 alcoholics admitted into Maryland psychiatric facilities from June 1963 to July 1964 showed that the median age of nonwhite men and women was 38 years, while comparable ages for white men and women were 46 and 44 years, respectively (Gorowitz et al. 1970). Two years later, a study in the same facility revealed that among nonwhite men and women the highest rates of admission with alcohol-related diagnoses were among those aged 35 to 44, while for white men and women, peak rates occurred in persons between 45 and 54 years of age (Gorowitz et al. 1970).

Similar patterns are reported in a series of studies on the characteristics of patients hospitalized for acute alcoholic psychoses in New York. Gross et al. (1963) reported that in a sample of 147 male patients, blacks had a mean age that was 8 years younger than whites. In a later study of 567 men (Gross et al. 1972), blacks also were found to be approximately 8 years younger than whites. There were twice as many black patients in the 20-34 age group; yet, in the oldest age groups, there were nearly three times more white than black patients. It was suggested that black patients probably develop alcoholism in response to the problems of late adolescence and early adulthood, while white men appear to resort to heavy drinking and develop alcoholism in reaction to the problems of middle age.

An analysis of clinical records of 1,400 men (Gross et al. 1971) reported that blacks experienced hallucinations more often and at younger ages than whites. Among blacks the largest percentage of hallucinations was in the 25 to 34 age group (39 percent), while among whites the highest percentage was in the 35-44 age group (62 percent).

A survey by Zax et al. (1967) of alcoholics in a variety of settings (e.g., Salvation Army, criminal justice system, hospitals, and psychiatric facilities) in Monroe County, New York, showed a strong overrepresentation of nonwhite males and females in the younger age groups. Seventy-four percent of the nonwhite men and 80 percent of the nonwhite women with a primary diagnosis of alcoholism were under 50 years old, compared with 47 percent and 64 percent of white men and women, respectively. The authors suggested that the relative youthfulness of nonwhites in alcohol treatment may be attributed to the following factors: (1) the excessive use of alcohol is probably a relatively new problem for nonwhites, (2) nonwhites who use alcohol excessively have a shorter lifespan, or (3) the nonwhite population of the locale under study is expanding very rapidly by reason of both a high birth rate and the migration of young people to the area.

Studies of treatment facilities in Missouri showed the same pattern. In an analysis of psychiatric admissions for alcoholism at both public and private facilities in Kansas City, Hornstra and Udell (1973) found that considerably more blacks (70 percent) than whites (46 percent) were under 45 years of age when admitted for treatment.

Similar findings were reported for a study of 100 black and 100 white male alcoholics at a treatment facility in St. Louis (Viamontes and Powell 1974). The mean age for blacks in the facility was 37 and for whites was 46. In general, blacks had started drinking earlier and lost control sooner than the white patients. Blacks began drinking at about age 15-1/2, compared with 19 for whites. Unmanageability of drinking problems began, on the average, at age 28 for blacks and at age 33 for whites. It was suggested that blacks may enter treatment earlier because of a lack of family support since a greater proportion are unmarried or divorced.

Locke and Duvall (1964) reported on alcoholic first admissions for Ohio mental hospitals in 1960. Among the major findings, they focused on the prominent age differences between black and white admissions:

> It is particularly noteworthy that among non-whites 69% of the alcoholic first admissions were under 45 years of age, whereas only 49% of the white alcoholic admissions were under this age. Among whites, the peak ages of admission were 45-49, followed closely by the 40-44 and 50-54 age groups. Among nonwhites, the peak ages were 40-44. Among metropolitan males the non-white: white ratios ranged from 4.4:1 at ages 25-29 to 2.1:1 at ages 60-64. . . . The marginal economic status of non-whites, possibly involving a lower nutritional level, may produce an earlier advent of the psychophysiological effects of alcohol. The earlier entrance of non-whites into the "working world" (non-whites generally have less years of schooling), the fact more than three-fourths of the non-whites aged 25-64 are out-of-state migrants, and that a greater percentage of the non-white females are in the labor force, would limit the availability of a custodial relative, thus militating against the retention in the home of the non-white alcoholic.
>
> (Locke and Duvall 1964, p. 525)

Alcohol Consumption and Traffic Accidents

A limited number of studies have examined the relationship between blacks, alcohol consumption, and automobile accidents, but several studies have concluded that blacks are at greater risk of accidents due to drinking than whites. This research suggests that during accident situations, blacks either exhibit higher blood alcohol concentration (BAC) levels than whites or are more vulnerable than whites to accidents and arrest at the same BAC level.

A study by Waller et al. (1969) of persons involved in traffic fatalities found that more blacks had been drinking than other groups and that a greater proportion had a BAC of 0.15 percent or higher. Among blacks, 69 percent had been drinking, compared with only 45 percent of whites; 50.6 percent of the blacks had BACs above 0.15 percent, whereas only 26.5 percent of whites had BACs at or above this level.

In a study of 152 respondents and 8,014 drivers in Grand Rapids, Michigan (Cosper and Mozersky 1968), blacks stood out as having the highest percentage (24 percent) of BACs at the moderate level (0.01 percent) and the severe level (over 0.04 percent) in spite of the fact that blacks were more likely to abstain and less likely to drive than whites. Blacks also exhibited disproportionately high rates of drivers who were considered to be drinkers.

Using part of the data base from the Grand Rapids study, a later analysis by Zylman (1972) examined racial differences in BAC level and collision experience with large groups of control and collision drivers. Nonwhites had higher rates of collisions than were expected based on their proportion in the population; of those experiencing collisions, a greater percentage of nonwhites exhibited BAC readings over 0.11 percent. In the control group, nonwhites showed a higher proportion of BAC levels over 0.08 percent than whites. These differences were attributed in part to the lower socioeconomic status of the nonwhite population. Persons coming from unskilled occupational backgrounds experienced higher rates of collisions and excess BAC levels than those from other backgrounds, and a large proportion of the nonwhite population fell into the lower socioeconomic strata. Higher rates of collisions would be expected among the poor because they tend to live in more congested and high-risk areas than other groups. However, even when controlling for socioeconomic status, nonwhites still exhibited unexpectedly high BAC levels in the control group.

Research on arrests for driving while intoxicated (ADWI) in Columbus, Ohio, and Santa Clara County, California (Hyman 1968*b*), found an overrepresentation of blacks in Ohio and those with Spanish surnames in California. Blacks were at least twice as likely to be arrested as other men, especially in age groups between 20 and 64. Since the proportion of ADWI involved in accidents with above-average BACs was not lower among blacks, Hispanics, and unemployed men than among others, the authors argued that police bias was not a significant factor in the overrepresentation of these groups for drunk driving arrests. In both areas, men living in low socioeconomic status census tracts were more vulnerable to arrest despite the fact that such households generally have less access to cars.

In a related study of 9,953 drivers who had been involved in accidents in Michigan, Hyman (1968*a*) found little difference in the distribution of BACs among blacks and whites. Yet blacks in every category of BAC were more vulnerable to arrest. Blacks tended to have higher accident vulnerability than whites at each educational level. For whites, educational attainment was inversely proportionate to accident vulnerability; for blacks, those completing college and high school were more vulnerable than those with less education.

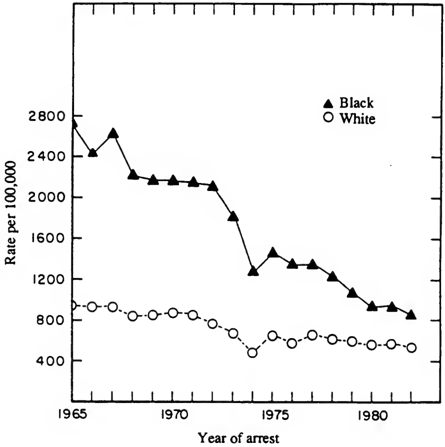
Explanations for blacks' greater risk for high BAC levels and higher accident and arrest rates than those of whites have focused on factors such as social alienation, status deprivation, and psychic stress (Cosper and Mozersksy 1968; Hyman 1968*a*, *b*). However, since the mid-1960s, when these studies took place, white rates of arrest for driving while intoxicated have risen greatly, equaling those for blacks (see the section below). The new patterns coincide with the increased focus on drinking and driving in American society, signaled by the rise of grassroots movements such as Mothers Against Drunk Driving and tougher drunk driving laws. The decline in black predominance in drunk driving seems to be largely related to new enforcement patterns which affect white and affluent drivers as well as blacks and persons of lower socioeconomic status, rather than to changes in blacks' intrapsychic makeup or changes in status and power relations between blacks and whites.

Alcohol Consumption and Crime

Arrests for Alcohol-Related Offenses

The most striking finding regarding arrests of blacks for alcohol-related offenses has been the enormous decline in arrests relative to the rates for whites over the past two decades. In 1965, the rate of black arrests for drunkenness in adults 18 years and older was over 2.5 times the rate for whites (2,741.9 versus 949.3 per 100,000 population, respectively) (figure 5). Blacks accounted for nearly one-fourth of all arrests for drunkenness although they constituted only one-tenth of the U.S. population. In the intervening years, the rate of arrests for drunkenness has greatly declined in both groups, but the change has been more pronounced among blacks. By 1980, black arrests were occurring at only a slightly greater percentage than white arrests. Blacks accounted for about 16 percent of arrests for drunkenness, about 5 percent in excess of their representation in the population; much of this difference can be attributed to the greater urbanization and lower socioeconomic status of blacks, since these factors were shown to influence rates of drunkenness arrests in some States (Skolnick 1954). The large decline in the overall arrest rate among both groups is probably due to the decriminalization of intoxication, changes in law

Figure 5. U.S. arrest rates for drunkenness among persons 18 years and over by race, 1965-1982



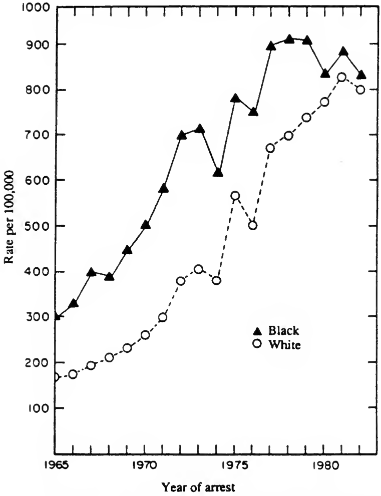
Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

enforcement practices, and the expansion of treatment services.

Racial differences in arrests for driving under the influence (DUI) exhibit a similar convergence (figure 6). In 1965, black arrests for DUI were substantially higher than those of whites (303.5 versus 168.6 per 100,000 population, respectively), although blacks were less likely to drink and probably less likely to drive. Over time, arrests have increased in both groups, but the increase has been greater for whites. Currently, blacks are about equally represented in DUI arrests in relation to their proportion of the population, and population rates for the two groups are very similar (813.4 versus 808.2 per 100,000 persons for blacks and whites, respectively).

The trend in arrests for violation of liquor laws shows a similar pattern of changes in black and white rates (figure 7). In 1965, the rate of arrests among blacks was nearly three times that of whites (231.0 versus 80.3 per 100,000, respectively). Blacks accounted for about one-third of all arrests although they constituted about one-tenth of the population. Since the 1960s, black arrest rates have declined slightly, and white rates have steadily increased. By the late 1970s,

Figure 6. U.S. arrest rates for driving under the influence among persons 18 years and over by race, 1965-1982



Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

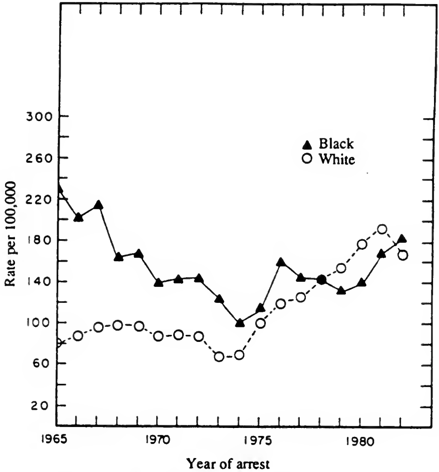
white rates surpassed those of blacks and remained elevated until 1982. In 1982, black rates were slightly above those for whites (184.6 versus 166.2 per 100,000).

Alcohol Involvement in Serious Crimes

This section draws heavily from a review on blacks, alcohol, and crime by Roizen (1981). Data from arrest records, prison records, and interviews do not generally support the view that blacks are more likely than whites to have been involved in a crime with alcohol. When blacks with serious social and personal problems–such as those found among black prison offenders–are compared to similar whites, they are less likely than whites to have drinking problems or to be heavy drinkers (Roizen 1981).

Prison studies show that a smaller proportion of black than white male offenders were drinking at the time of the crime. Grigsby (1963) found that 26 percent of black male offenders in Florida were intoxicated at the time of the crime, compared with 32 percent of whites. Mayfield's (1972) analysis showed that 53 percent of blacks in North Carolina were intoxicated, compared with 60 percent of whites. A 1974 Law Enforcement Assistance Administration (LEAA) survey

Figure 7. U.S. arrest rates for liquor law violations among persons 18 years and over by race, 1965-1982



Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

(U.S. Department of Justice, LEAA 1975) found 37 percent of blacks drinking at the time of the crime, compared with 50 percent of whites. The Single Study of Women (Cole et al. 1968), an analysis of women homicide offenders only, reports a larger proportion of black than white female drinkers (56 percent versus 45 percent).

The differences between black and white samples in the proportion of drinking diminish dramatically with age for both broad categories of crime. Black property offenders over 40 are only slightly less likely than whites to have been drinking. Among those having committed crimes against the person, older black offenders are about as likely as whites to have been drinking. However, among young offenders–who are overrepresented in prison populations–blacks were less likely than whites to have been drinking at all or drinking heavily at the time of the crime.

Another measure of the relationship of drinking and crime is the prevalence of reported drinking problems in prison populations. Grigsby's (1963) study of Florida inmates showed that 43 percent of white offenders were "regular drinkers," compared with 30 percent of nonwhites. The Mississippi study by Globetti et al. (1974) reported that 56 percent of whites compared with 34 percent of blacks were "regular drinkers." Guze et al. (1962) found that 47 percent of white offenders in Missouri were labeled alcoholics, compared with 27 percent of blacks. The 1960 State of California survey of drinking problems of newly committed offenders, the largest of these studies, reports twice as many white as black offenders with drinking problems (Roizen 1981).

Finally, homicide studies of jailed offenders show a more equal pattern of black/white alcohol involvement. Black offenders were as likely as or more likely than whites to have been drinking at the time of the homicide (Roizen 1981).

Surveys of Drinking Patterns and Problems in the Adult Population

National Surveys

Since the 1950s, regular nationwide surveys of drinking patterns and problems have been conducted in the United States. These surveys have included small subsamples of blacks which yield general information on their drinking patterns. Due to the small number and skewed geographical distribution of black respondents, the studies cannot be assumed to be reliably representative of the black population as a whole. In addition, because of differences in drinking measures, comparisons across different studies should be viewed with caution. Rates of drinking should be regarded as rough indicators for comparing differences between blacks and whites in the same study, not as absolute measures of drinking patterns.

The 1964-1965 national survey of national practices (Cahalan et al. 1969) included 200 black respondents. The study showed that black and white men varied little in their drinking patterns. Roughly 30 percent of the men in both races abstained or drank infrequently, nearly 50 percent were in the light-to-moderate category, and about 20 percent were heavy drinkers. However, black women differed from white women both in their much higher proportion of abstainers (51 percent versus 39 percent, respectively) and in their higher rate of heavy drinkers (11 percent versus 7 percent).

In a study of problem drinkers based on a 1967 reinterview with a subsample from the 1964 national survey (Cahalan 1970), blacks (along with those of Caribbean and Latin ancestry) showed the highest rate of social consequence drinking problems. Blacks also exhibited very high scores for measures of alienation and maladjustment and for unfavorable expectations regarding personal achievement and happiness goals.

Similar findings on the relatively high prevalence of black alcohol-related problems were described in a later study of problem drinking among American men (Cahalan and Room 1974). The study combined two national samples (the data from 1967 with a new sample from 1969) comprising a total of 1,561 adult males ages 21-59, including approximately 100 blacks. Again, blacks, along with those of Latin American and Caribbean ancestry, showed the highest rates of heavy drinking. Blacks also exhibited among the highest rates of problem consequences from drinking. By controlling for socioeconomic and other sociodemographic factors, black/white differences in the rates of drinking problems were considerably reduced. This finding suggests that high problem rates among blacks may be more a reflection of high-risk social characteristics (e.g., poverty, residence in a large city, youthfulness) than of strictly racial or cultural factors.

Data from a series of nationwide surveys conducted by Harris and Associates (1971, 1972, 1973, 1974) provided data on black (nonwhite) and white alcohol consumption patterns by beverage types. In general, about equal numbers of blacks and whites reported drinking beer during the preceding month, while fewer blacks indicated that they drank wine or hard liquor during this period. Among those respondents indicating that they drank during the preceding month, blacks were much more likely to drink beer or spirits, primarily on the weekends, and to drink wine more frequently than whites. Across all the beverage types, but particularly for wine and spirits, blacks appeared to drink in considerably higher amounts per day than whites. When problem rates were examined for the two groups (Harris and Associates 1971), substantially more blacks than whites (23 percent versus 9 percent) worried about their own drinking or indicated that their relatives worried about their drinking (18 percent versus 9 percent). In addition, a higher proportion of black respondents reported having hangovers and drinking more than they intended to or to have had trouble in stopping their drinking.

In more recent national surveys, blacks have reported higher rates of abstention and similar rates of heavy drinking compared with whites. In a study of attitudes towards alcohol education campaigns (Rappaport et al. 1975), blacks were more likely than whites to classify themselves as abstainers (47 percent versus 33 percent); both were equally likely to classify themselves as semiabstainers (10 percent). At the other extreme, 23 percent of blacks were classified as heavy drinkers, compared with 28 percent of whites.

Using a similar data base as the Rappaport study, Johnson et al. (1977) reported that abstaining from drinking was more prevalent among black women and black men (59 percent and 38 percent, respectively) than among white women and white men (42 percent and 25 percent, respectively). However, a smaller proportion of blacks were described as moderate or heavier drinkers (4 percent versus 9 percent for women and 16 percent versus 21 percent for men). Men and women of each race displayed similar BAC levels and rates of alcohol problems (21-24 percent for males and 13-14 percent for females).

Clark and Midanik's (1982) report on the 1979 National Survey of Drinking Practices also showed higher rates of abstention among black males and females (30 percent and 49 percent, respectively) when compared with white men and women (25 percent and 39 percent, respectively). The study showed that white men had considerably higher rates than blacks of very heavy drinking (21 percent versus 14 percent), while black women had higher rates than white women of heavy consumption (7 percent versus 4 percent). White men were twice as likely as black men to exhibit social problems as a result of drinking (6 percent versus 3 percent), although black and white women were quite similar on this measure (2 percent and 3 percent, respectively).

Regional Surveys

Urban North. Studies examining black drinking patterns and problems in northern cities during the 1960s tended to show relatively high rates of heavy drinking and alcohol-related problems. However, most studies focused on populations concentrated in high density, low socioeconomic areas, which may limit their applicability to blacks in other settings.

A study of drinking patterns among adults in western New York State (Barnes and Russell 1977) showed that rates of heavy drinking were considerably higher than national rates for the sample as a whole, as well as for black respondents. The study was based on personal interviews with 1,039 respondents randomly selected to represent households in Erie and Niagara Counties. Blacks were proportionately represented in the study, but the number of black respondents was quite small (N = 59). The major differences between black respondents and others was the high proportion of blacks (35 percent) who were abstainers compared with whites (13 percent). However, rates of heavy drinking were very similar, 24 percent and 23 percent, respectively, among blacks and whites. The rates of heavy drinking recorded in this region for both groups were about twice the rates recorded in a 1964-1965 national survey (Cahalan et al. 1969). The difference was attributed not only to increases in the rate of heavy drinking over time, but to regional differences in drinking patterns. The Northeast is traditionally "wetter" than other areas; hence, in the 1964-1965 survey, this area exhibited higher rates of heavy drinking than the country as a whole (19 percent versus 12 percent).

The comparatively "wet" patterns for New York State were replicated in a study of drinking patterns in the Boston area (Wechsler et al. 1978). A household survey of 1,043 adults, including 112 blacks, found generally a higher percentage of heavy drinkers than was found in Cahalan's national sample. Only about 17 percent of the respondents were classified as abstainers, while 23 percent were described as heavy drinkers. Black and white males differed little in drinking patterns–about 13 percent of each group were abstainers, nearly half ranged between infrequent and moderate drinking, and 39 percent were categorized as heavy drinkers. However, black women had nearly double the rate of abstainers as white women (36 percent versus 17 percent, $p < .01$). In contrast, the two groups of women exhibited very similar rates of heavy drinking (11 percent and 12 percent, respectively).

In one of the first epidemiological studies of "alcoholism" in a community setting (Washington Heights in New York City), Bailey et al. (1965) showed that blacks, particularly black women, are subject to higher rates than whites of "alcoholism" (defined as excessive drinking and/or presence of difficulties and problems due to drinking). Rates per 1,000 population were 37 for black men compared with 31 for white men. Black women, however, exhibited a rate four times that of white women (20 versus 5 per 1,000 persons). When the sex ratio of alcoholism was calculated by race, the ratio for whites was 6.2 men to 1 woman, while that for blacks was 1.9 to 1. The high rates of "alcoholism" among black women were attributed to a permissive culture for female drinking and to the greater tendency of black women to head households and to be the major breadwinners.

Higher rates for blacks as a whole were reported in a related study on problem drinking in New York City

(Haberman and Sheinberg 1967). Blacks had a rate of "implicative" or problem drinking more than twice that for white Protestants—105 versus 49 per 1,000 persons. The low sex ratio of problem drinking among blacks observed in the previous study was also reported. The sex ratio for whites was 4 men to 1 woman, whereas for blacks it was 1.2 men to 1 woman.

A more recent survey (Weissman et al. 1980) of alcoholism prevalence in the New Haven, Connecticut, area echoed the findings of previous studies. Alcohol problems and psychiatric symptoms were assessed in a longitudinal study of a mental health catchment area. The final wave of data was collected from 457 whites and 53 nonwhites that had also been interviewed during 1967 and 1969. Respondents were asked a series of questions from the Schedule for Affective Disorders and Schizophrenia (SADS) and the Research Diagnostic Criteria for Alcoholism (RDC). On the basis of these measures, the point prevalence and lifetime prevalence of probable and definite alcoholism were considerably higher among nonwhites than whites. The point prevalence of probable and definite alcoholism was 9.5 per 100 persons for nonwhites and 1.8 per 100 persons for whites. The lifetime prevalence of alcoholism for nonwhites was 18.9 per 100 persons and only 5.2 per 100 persons for whites. In general, alcoholism rates were highest among males, the lower social classes, middle-aged and older groups, and divorced, single, or separated persons.

Studies conducted in the St. Louis, Missouri, area drew similar conclusions about high alcohol problem rates among blacks. Research on samples of men selected from elementary school records revealed that heavy drinking was twice as common among blacks as among whites and that problems from drinking were more than three times as common (Robins et al. 1968). Black men reported a broad range of legal, social, medical, and family problems due to drinking. About one-third had a history of medical problems and family complaints, one-half reported personal concern about drinking excessively, and one-fifth either had been arrested for alcohol-related offenses or had a public record of some drinking problem.

Unlike other researchers, Robins et al. (1968) deemphasized the relationship between social status and the prevalence of drinking problems among black males. Instead, high problem rates were attributed to the greater frequency of unstable homes and juvenile delinquency among blacks.

A survey of housing project residents in St. Louis (Sterne and Pittman 1972) reported very high rates of heavy drinking for a small sample of black men (50 percent) and very high rates of abstaining in black women (47 percent). No comparison group of white project residents was surveyed. However, when the findings were compared with survey results from groups of California blacks (see Berkeley 1960 and San Francisco 1962 samples below), St. Louis males had considerably higher rates of heavy drinking, but women in both places exhibited high rates of abstinence. Drinking patterns were found to be related to gender, church attendance, attitudes toward drinking, and, to a lesser extent, age, socioeconomic status, and some aspects of sociability. Little direct information on alcohol-related problems was collected in this study. However, "street drinking," health, and marital problems were discussed by project residents in another survey and in ethnographic interviewing.

In contrast to the high rates of heavy drinking and alcohol problems described for most black adults in the urban North, a study of drinking patterns of the black elderly (Johnson 1974) suggested that this group may be at less risk for problems than younger blacks. In a study of the drinking patterns and health status of persons on the Upper East Side of Manhattan, considerably more blacks were described as being abstainers than whites (51 percent and 37 percent, respectively). Similarly, blacks were about half as likely to report being frequent drinkers as whites (17 percent versus 32 percent). Among both blacks and whites, those in good health were more likely to be drinkers than those in poor health.

Southern States. Very few studies have explored the drinking patterns of black adults in the South. Only three surveys were described in the contemporary literature, and two of these took place in Mississippi prior to 1965, when much of the State was under prohibition. All three of the surveys report high rates of abstention among black respondents—rates which are somewhat higher than for whites in the South and considerably higher than for either whites and blacks in other regions.

Globetti's (1967) survey of 108 black respondents in Mississippi reported that only 36 percent of the sample had used alcohol twice in the year prior to the study. (A comparable study showed about 44 percent of whites in Mississippi to be drinkers.) Among blacks, 60 percent of the males and 76 percent of the females were classified as abstainers. Of the drinkers, most drank infrequently (1-15 times per year) and in small quantities (one to two drinks per sitting).

Reasons for high rates of abstaining and low rates of drinking among blacks were attributed to the same socioenvironmental factors that affect rates among whites. These include legal proscriptions against alcohol use, restrictive religious norms, and sociodemographic factors such as low levels of educational attainment and low socioeconomic status.

High rates of abstention were also reported in a study of contrasting Mississippi communities (Windham and Aldridge 1965). Blacks (N = 183) and whites (N = 395) were surveyed in a study of alcohol attitudes in two Mississippi communities–one located in a Delta community where beer drinking was permitted, the other in a completely "dry" hill community. As expected, rates of drinking were higher for both blacks and whites in the more permissive Delta area than in the hill community. However, black rates of drinking were lower than respective rates for whites in each community.

Low rates of black alcohol consumption again were reported in a more recent epidemiologic study of drug use in a Florida county (Warheit et al. 1976). Although there were few racial differences in overall rates of drug use, there were significant differences in the use of alcohol. About 71 percent of the whites compared with 43 percent of the blacks reported using alcohol. Black males were more than twice as likely as black females to report drinking (61 percent versus 30 percent). There was less of a difference between white males and females (80 percent versus 60 percent). Whites also reported using alcohol more frequently (frequent use was defined as use every day, all of the time, or often) than blacks. The race-sex differences were quite dramatic: 31 percent of the white males said they drank alcoholic beverages frequently compared with only 3 percent of the black females. About 20 percent of both white and black males reported frequent use of alcohol. The low rates of reported consumption by blacks were attributed to strong religious proscriptions regarding drinking, which would both inhibit actual drinking and also make drinkers less willing to report their use of alcohol.

A recent study (Neff and Husaini 1984) of rural and urban blacks in Tennessee showed patterns which were quite different from those described in previous studies on southern drinking patterns. When adjustments were made for differences in socioeconomic status, the prevalence of abstaining was actually *lower* for black men in both urban and rural areas and lower for black women in the rural areas. However, black drinkers included a smaller proportion of heavy drinkers than whites in urban areas. (Data were not available for the rural sample.) The prevalence of social problems for all groups was very similar (from 21 percent to 25 percent) except for rural women, particularly blacks, who reported few or no problems.

The study also showed important variations in the age distribution of heavy drinking and rates of problems for black and white men. (However, due to the small numbers of respondents in the various age categories, the findings must be viewed as suggestive only.) Among urban drinkers, the proportion of white heavy drinkers increased with age until 40-49; however, heavy drinking declined consistently through the forties for urban blacks, with an increase in the 50-59 age group. Among men of both races, alcohol-related problems peaked in the 40-49 age group, then declined dramatically for those over age 50. Problems were greatest in the 40-49 age group for both rural and urban blacks. Urban blacks age 18-29 also showed high levels of alcohol problems even when the study was controlled for socioeconomic factors.

The West. Data on black drinking patterns in California have been collected through a series of larger general population surveys dating from the early 1960s through the mid-1970s. The studies generally portray similar overall patterns of black and white drinking, except for higher rates of abstinence among blacks, particularly women.

One of the first studies to report on black drinking practices in California took place in Berkeley in 1960 (Knupfer and Lurie 1961). About 100 blacks were interviewed in a study involving a probability sample of the adult population of the entire city. Considerably more blacks were abstainers than whites (32 percent versus 20 percent of those interviewed). Black and white males exhibited similar rates of heavy drinking (28 percent and 29 percent, respectively), but significantly more white females were heavy drinkers than black females (15 percent compared with 7 percent).

Similar results were obtained in a survey of drinking patterns in San Francisco in 1962 by the California Drinking Practices Study (Sterne and Pittman 1972), which included about 123 black respondents. Again, a considerably greater proportion of blacks were abstainers when compared to whites (32 percent versus 21 percent of those interviewed), and significantly more white females were heavy drinkers than black females (15 percent compared with 7 percent).

A later study (Cahalan and Treiman 1976) of drinking patterns in a general population survey of San

Table 5.—Drinking patterns by sex and race/ethnicity, in percent[a]

	Male			Female		
Pattern	White	Black	Hispanic	White	Black	Hispanic
Abstainer	11	16	14	18	29	32
Occasional	9	7	6	18	19	20
Infrequent	13	17	17	27	23	24
Frequent low maximum	20	21	16	22	14	14
Frequent high maximum	26	17	21	11	9	7
Frequent heavier drinker	21	22	26	4	6	3
N	(1,047)	(468)	(279)	(1,280)	(738)	(355)

Source: Caetano (1984).

Note: χ^2 males (crude data) = 30.432, df = 10, $p < .001$; χ^2 females (crude data) = 76.800, df = 10, $p < .001$.

[a] Age-standardized percentages are available in the original paper, but are not presented here since they are very similar to the nonstandardized distributions shown here.

Francisco showed particularly low rates of heavy drinking, intoxication, and drinking problems among black respondents compared with white Protestants respondents. Only 1 percent of blacks compared with 10 percent of white Protestants were characterized as frequent heavy drinkers. Over half of the black respondents (56 percent), but only one-quarter (25 percent) of the white Protestants were described as infrequent drinkers or abstainers. Blacks were ranked considerably lower than white Protestants on alcohol problem indices such as high intake, symptomatic drinking, and loss of control. However, blacks and whites reported similar rates of marital problems.

A more recent study of an all black sample in San Francisco (Lipscomb and Trocki 1981) found higher rates of heavy drinking than the Cahalan and Treiman study (1976) using a similar quantity-frequency measure of drinking patterns. The later study found that 7 percent as opposed to 1 percent of blacks interviewed were frequent heavy drinkers. However, identically high rates of abstention and infrequent drinking were recorded for blacks in both surveys. The discrepancy in rates of heavy drinking observed in the two surveys could be due to increases in heavy drinking among blacks. However, the stability of abstaining and moderate drinking suggests that the differences may be due to the difference in sample bases in the two studies. The later study included a much larger number of blacks living in black neighborhoods and would be expected to give a broader range of variation in drinking patterns.

In contrast to the moderate rates of heavy drinking described for San Francisco blacks, a statewide study of California drinking patterns in 1974 with 83 black respondents (Cahalan 1976; Cahalan and Treiman 1976) showed comparatively high rates of heavy drinking among blacks. About 15 percent of blacks and only 9 percent of whites interviewed were heavy drinkers. Yet, as in earlier studies, blacks were considerably more likely to be abstainers than whites (29 percent versus 15 percent). Rates of problems were similar as a whole for blacks and whites (10 percent and 9 percent, respectively).

Between 1977 and 1980, a large-scale survey of black drinking patterns took place in the San Francisco Bay area. The study was implemented through three surveys on random samples of the general population in three California counties. Personal interviews were conducted over a period of 3 years with a total of 4,510 adults between the ages of 18 and 59 years to evaluate a State-funded alcohol problem prevention campaign (Wallack and Barrows 1981). Combined samples included 1,206 persons who identified themselves as "black, Afro-American, or Negro." Data on substantial numbers of whites and Hispanics also were provided from the survey.

The results of the study permitted a more detailed analysis of the effect of social-demographic variation on black drinking patterns than had previously appeared in the literature (Caetano 1984). At the aggregate level, the survey showed a picture of black drinking that was highly consistent with previous studies. Black and white males had almost identical rates of frequent heavy drinking, although black men were considerably less likely to be frequent high maximum drinkers than white men (table 5). Black men also were more likely than white men to be abstainers. Hispanic men had lower rates of abstinence and higher rates of frequent heavy drinking than men of the other two groups.

Black and Hispanic women exhibited much higher rates of abstinence than white women. Drinking among women in all three groups was concentrated in the occasional or infrequent categories. White women were more likely to be frequent drinkers in either the low or high quantity category than either black or Hispanic women. However, black women were more likely than white or Hispanic women to be classified as frequent heavier drinkers.

One of the major findings of the study, which had not previously been reported in the literature, was the striking differences between the blacks, Hispanics, and whites in rates of heavy drinking for males according to age group (table 6). Among whites, frequent heavy drinking was concentrated among young males between 18-29 years old, but rapidly declined and stabilized after males reached the 30 and 39 year age group. Among black males, however, frequent heavy drinking was relatively uncommon in the younger age group, but rose dramatically for men between 30 and 39 years old. Rates of heavy drinking gradually declined among middle-aged and elderly blacks. Hispanics showed a different pattern, in which heavy drinking was very high in young men and in men aged 30-39. However, rates of heavy drinking declined substantially in late middle-aged and older Hispanics.

As previously noted, the prevalence of heavy drinking in older blacks may increase their vulnerability to physiological problems. If heavier drinking is delayed until middle age, it may be associated with more sustained patterns of high consumption than among whites, whose heavy drinking is a short-term youthful phenomenon. A prolonged pattern of heavy drinking is likely to increase the risk for alcohol-related chronic disorders.

Black and white men exhibited similar rates of current alcohol problems, which were lower than rates reported by Hispanics. The highest ranked problem for men, regardless of ethnicity, was spouse or family concern about drinking. Health problems due to drinking ranked second among blacks, whites, and Hispanics. Very low rates of alcohol problems were recorded for women of all three groups. However, black and Hispanic women were more likely than white women to report spouse or family member problems due to drinking.

For all three groups, the number of drinks per month and the frequency of drunkenness were the strongest predictors of the number of drinking problems. For males, the prevalence of four or more problems paralleled differences in the peak ages of heavy drinking. Problem prevalence for white males was highest from 20 to 29 years, after which it declined sharply. Among blacks and Hispanics problems were low in young males and abruptly rose in the 30-39 group. Problem rates declined considerably for males over 40 and even more dramatically for those over 50.

In a separate analysis of black respondents using the same data set, additional insight was gained regarding specific factors influencing drinking patterns (Caetano and Herd 1984). In general, the analysis revealed that socioeconomic factors are less strongly associated with black drinking patterns than is true in the general population. The association of income, education, and employment status with amount of drinking was not statistically significant in a regression analysis on male drinking patterns. Only the variable of fundamentalist religious affiliation reached statistical significance–and, as might be expected, the association with alcohol use was negative. Among females, however, marital status (being married or living together) and being older, along with religious fundamentalism, were negatively associated with drinking. Employment was positively associated with drinking for women. The study concluded that internalized norms, such as religious beliefs and attitudes towards women's roles and conduct, may have comparatively more influence on black drinking patterns than socioeconomic factors.

The 1984 National Survey of Black and Hispanic Drinking Patterns[1]

This section highlights preliminary findings from the first national survey of black and Hispanic drinking

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[1] This survey was implemented by the Alcohol Research Group, Institute of Epidemiology and Behavioral Medicine, Medical Research Institute of San Francisco, through a subcontract with the Institute of Survey Research, Temple University. Funding for the study was provided by the National Institute on Alcohol Abuse and Alcoholism through grants AA06050 and AA05595.

Table 6.—Drinking patterns by age group and race/ethnicity among males, in percent

Pattern	18-29			30-39			40-49			50-59		
	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic	White	Black	Hispanic
Abstainers	9	16	13	10	11	9	12	17	15	14	29	24
Occasional	7	8	7	12	6	6	9	5	2	10	10	4
Infrequent	12	18	17	15	16	21	15	16	12	13	14	13
Frequent low maximum	15	23	12	16	16	19	27	24	17	27	21	20
Frequent high maximum	27	18	17	32	21	16	20	16	34	20	10	28
Frequent heavier drinkers	29	17	34	15	30	29	17	21	20	16	17	9
N	(381)	(180)	(107)	(266)	(141)	(86)	(154)	(75)	(41)	(246)	(72)	(45)

Source: Caetano (1984).

Table 7.—Typology of frequency of drinking based on five or more drinks used in the 1984 U.S. National Drinking Survey, in weighted percents (N = 5,221)

Drinking frequency	Never drinks 5 or more	Drinks 5 or more at least once a year	Drinks 5 or more at least once a week
At least once a week	Frequent low maximum 11.2	Frequent high maximum 12.5	Frequent heavy drinker 12.0
1-3 times a month	Less frequent low maximum 12.3	Less frequent high maximum 6.3	–
1-11 times a year	Infrequent 15.3	–	–
Less than once a year or never	Abstainers 30.2	–	–

patterns and problems. A more detailed report on black drinking patterns based on the national survey data is in preparation. Thus, the findings discussed in this section should be viewed as preliminary only. Data for the study were collected in 1984 through personal interviews with 1,947 blacks and 1,771 whites.

Blacks include all respondents who classified themselves as "black, not of Hispanic origin." Whites are defined as those who designated themselves as "white, not of Hispanic origin"; the category excludes those who classified themselves as Asians, Pacific Islanders, American Indians, or Alaskan Natives. (The findings on Hispanics are reported by Caetano, in this volume.)

Respondents were selected by using area probability methods which sampled the adult population of the United States residing in households (excluding Alaska and Hawaii). The survey response rate was 75.9 percent for blacks and 72.2 percent for whites.

Drinking patterns in the analysis are described by using a two-dimensional typology which takes into account both the quantity and frequency of alcohol consumption (table 7). The typology is based on a series of items on how often alcohol is used and on the quantities, both average and maximum amounts, consumed (Room 1985).

Drinking patterns. The data from the study suggest that at an overall level black and white men have very similar drinking patterns (table 8). Altogether, 30 percent of black men were classified as abstainers, compared with 23 percent of whites; similar proportions of blacks and whites reported drinking infrequently (about 10 percent), drinking in the less frequent categories (16 percent), and drinking in the more frequent categories (about 30 percent). Slightly more whites than blacks (19 percent versus 15 percent) were considered frequent heavier drinkers.

Among women, there appeared to be greater differences between the races. Nearly half of the black female population (46 percent) compared with only about one-third (34 percent) of white women were described as abstainers. Similar proportions of black and white women indicated drinking in the infrequent and less frequent drinking categories, but white women appeared to drink more frequently than blacks. Twice as many white as black women (8 percent versus 4 percent) were classified as frequent high maximum drinkers. However, an almost identical proportion of the two groups of women fell into the heaviest drinking category (4 percent and 5 percent for blacks and whites, respectively).

Table 8.–Drinking patterns by sex and race, in weighted percents

	Men		Women	
Pattern	Black	White	Black	White
Abstainers	29	23	46	34
Infrequent drinkers	10	11	17	19
Less frequent low maximum drinkers	8	10	16	14
Less frequent high maximum drinkers	8	6	4	7
Frequent low maximum drinkers	12	12	9	13
Frequent high maximum drinkers	18	18	4	8
Frequent heavier drinkers	15	19	4	5
N	(715)	(743)	(1,221)	(1,030)

In spite of the similarity in aggregate drinking patterns reported for black and white men, important differences between the two groups emerged when associations between levels of drinking and some sociodemographic characteristics were examined. For example, the age distribution of drinking patterns showed that among whites frequent heavy drinking was most prevalent among those in the 18-29 year age group (table 9). Among blacks, however, rates in this age group were very low. For men between 30 and 39 years old, blacks showed a sharp increase in rates of frequent high maximum drinking, while rates among whites were fairly stable. As will be described later, the increase in frequent high maximum drinking was paralleled by high problem rates for black men in the 30-39 year age group.

Among women, similar racial patterns are observed in the age distribution of drinking. Young white women (in the 18-29 year age group) are much more likely than young black women to drink at all, to drink frequently, or to drink at high maximum levels (table 10).

The differences between blacks and whites in the age distribution of drinking echo the findings of prior research on the low levels of drinking among black adolescents and college students (to be described in a later section) and may stem from variations in socialization into adulthood and drinking, in living patterns, or in socioeconomic characteristics between black and white youth.

Black and white men also differed substantially in the relationship between some indicators of socioeconomic status and frequent heavier drinking. Among white men increasing levels of family income were associated with increases in heavy drinking; however, as income rose among blacks, rates of heavy drinking fell (table 11). The divergence in the association between income and the two groups of men may be a function of differences in their social backgrounds or in the type of occupations they hold.

In the female popoulation, there were fewer differences between blacks and whites; increases in income and education were generally associated with a decline in abstinence and an increase in frequent drinking (table 12).

In addition, major differences were observed for black and white men in the distribution of drinking patterns by geographical region (table 13) and the degree of urbanization (table 14). Generally, the drinking patterns of whites reflected the traditional split between "wet" and "dry" regions and urban/rural locations. That is, heavier drinking was concentrated in the

Table 9.—Drinking patterns among men by age group and race, in weighted percents

Pattern	18-29		30-39		40-49		50-59		60+	
	Black	White	Black	White	Black	White	Black	White	Black	White
Abstainers	23	16	15	13	37	18	29	30	60	40
Infrequent drinkers	10	9	6	10	8	19	23	7	14	12
Less frequent low maximum drinkers	10	11	8	8	9	14	4	6	6	9
Less frequent high maximum drinkers	14	10	7	9	3	2	3	8	1	0
Frequent low maximum drinkers	10	4	15	12	13	10	14	13	7	24
Frequent high maximum drinkers	17	20	33	26	17	17	7	19	6	10
Frequent heavier drinkers	16	31	17	22	14	19	20	17	5	4
N	(204)	(201)	(169)	(165)	(115)	(97)	(77)	(90)	(145)	(187)

Table 10.—Drinking patterns among women by age group and race, in weighted percents

Pattern	18-29		30-39		40-49		50-59		60+	
	Black	White	Black	White	Black	White	Black	White	Black	White
Abstainers	34	22	32	30	55	35	60	36	69	50
Infrequent drinkers	20	20	19	17	12	21	14	21	12	18
Less frequent low maximum drinkers	22	14	18	16	11	12	12	12	8	15
Less frequent high maximum drinkers	4	13	6	10	5	6	2	3	2	0
Frequent low maximum drinkers	8	11	15	7	7	13	7	23	8	15
Frequent high maximum drinkers	6	13	5	13	4	7	4	4	0	1
Frequent heavier drinkers	6	7	5	8	6	7	2	1	1	1
N	(366)	(236)	(307)	(217)	(132)	(144)	(147)	(120)	(250)	(310)

Table 11.—Drinking patterns among men by yearly income and race, in weighted percents

Pattern	$6,000 or less		$6,001-$10,000		$10,001-$15,000		$15,001-$20,000		$20,001-$30,000		$30,000 and over	
	Black	White	Black	White	Black	White	Black	White	Black	White	Black	White
Abstainers	34	32	26	36	30	30	32	30	21	22	30	13
Infrequent drinkers	12	10	8	10	10	16	9	10	17	15	9	8
Less frequent low maximum drinkers	8	11	4	5	5	10	3	11	18	8	11	11
Less frequent high maximum drinkers	4	1	6	4	2	6	20	8	6	10	11	6
Frequent low maximum drinkers	8	9	11	14	11	11	11	10	14	13	12	13
Frequent high maximum drinkers	21	14	24	21	20	12	7	13	10	16	22	25
Frequent heavier drinkers	12	22	21	10	23	16	18	19	14	17	6	24
N	(160)	(62)	(149)	(70)	(94)	(84)	(85)	(97)	(85)	(150)	(94)	(233)

Table 12.—Drinking patterns among women by yearly income and race, in weighted percents

Pattern	$6,000 or less		$6,001-$10,000		$10,001-$15,000		$15,001-$20,000		$20,001-$30,000		$30,000 and over	
	Black	White	Black	White	Black	White	Black	White	Black	White	Black	White
Abstainers	52	53	44	44	50	38	28	27	29	28	34	25
Infrequent drinkers	14	17	16	20	16	20	19	22	21	24	17	16
Less frequent low maximum drinkers	10	10	18	12	15	11	31	16	32	15	13	18
Less frequent high maximum drinkers	5	6	7	8	4	8	2	3	3	6	4	6
Frequent low maximum drinkers	9	5	8	7	6	11	8	16	8	13	28	17
Frequent high maximum drinkers	5	4	6	6	3	4	4	10	3	7	3	13
Frequent heavier drinkers	5	4	2	2	6	7	8	7	4	6	2	4
N	(502)	(153)	(214)	(140)	(125)	(129)	(103)	(109)	(105)	(190)	(67)	(241)

Table 13.—Drinking patterns among men by U.S. regions and race, in weighted percents

Pattern	Northeast		North Central		South		West	
	Black	White	Black	White	Black	White	Black	White
Abstainers	34	14	17	16	34	34	21	26
Infrequent drinkers	18	14	9	10	7	11	16	8
Less frequent low maximum drinkers	10	10	8	10	7	10	14	10
Less frequent high maximum drinkers	4	5	21	5	5	7	3	6
Frequent low maximum drinkers	9	15	16	12	10	10	15	13
Frequent high maximum drinkers	8	20	18	23	22	15	15	14
Frequent heavier drinkers	16	20	12	23	15	14	15	22
N	(132)	(174)	(116)	(195)	(400)	(231)	(68)	(141)

Table 14.–Drinking patterns among men by degree of urbanization and race, in weighted percents

Pattern	Metropolitan cities of 50,000 or more		Metropolitan cities of less than 50,000		Nonmetropolitan areas	
	Black	White	Black	White	Black	White
Abstainers	30	17	30	20	28	34
Infrequent drinkers	9	13	15	10	9	11
Less frequent low maximum drinkers	10	5	9	13	4	10
Less frequent high maximum drinkers	3	7	12	4	13	8
Frequent low maximum drinkers	14	19	10	10	8	9
Frequent high maximum drinkers	14	16	14	23	28	14
Frequent heavier drinkers	20	22	9	21	10	14
N	(412)	(226)	(164)	(289)	(140)	(226)

North and Midwest and in cities. Conversely, in the South and in rural areas, abstinence and lighter drinking were prominent. These patterns did not hold for black men; heavy drinking (combined rates of frequent high maximum and frequent heavier drinking) was highest in the South and in nonmetropolitan areas. Hence, for black men, abstinence and lighter drinking patterns were as common in some northern areas and in small cities as in the dryer southern and rural settings. Among women, there were fewer differences between the races, and both groups showed a positive association between rates of drinking and residing in wetter geographical regions–the Northeast, the North Central, and the West (table 15)–and in cities (table 16).

The findings for black men differ greatly from the results of previous general population surveys and from epidemiological analyses on the regional distribution of liver cirrhosis. As described in an earlier section, these data indicated that rates of heavy drinking and of alcohol-related problems were highest in the urban Northeast and lowest in the South. The contrasting picture in the national data may reflect recent shifts in regional patterns of drinking among black men. Herd's analysis (1985*b*) suggests that the South appears to be increasingly associated with high rates of cirrhosis mortality. Hence, the greatest increase in mortality rates between 1949 and 1971 occurred in the coastal South, and even in the deep South, rates were slowly rising. It may be that in recent years alcohol consumption among blacks has rapidly increased in the South but has remained fairly stable among blacks in the North, leading to the blurring of regional differences and the comparatively high rates of heavy drinking in the South.

In general, the preliminary findings indicate that although black and white men share roughly similar drinking patterns, major differences occur in the age groups associated with heavy drinking and in the relationship between drinking patterns and some social and demographic characteristics. Hence, there may be important racial differences in the etiology of heavy drinking and in the subgroups at risk for excessive consumption and alcohol-related problems. Among women, there are greater differences in overall drinking patterns, but more similarity in how socioeconomic and geographic factors affect black and white drinking. Although not described in this report, black and white women do differ substantially in the relationship between drinking levels and some social characteristics (e.g., marital and employment status). These findings suggest that important sociocultural and gender differences

Table 15.—Drinking patterns among women by U.S. regions and race, in weighted percents

Pattern	Northeast		North Central		South		West	
	Black	White	Black	White	Black	White	Black	White
Abstainers	37	20	31	32	56	48	38	30
Infrequent drinkers	25	29	15	15	15	20	11	11
Less frequent low maximum drinkers	16	12	24	14	12	10	23	22
Less frequent high maximum drinkers	5	6	5	10	3	5	4	6
Frequent low maximum drinkers	10	18	14	14	7	9	12	10
Frequent high maximum drinkers	4	10	6	9	4	4	5	12
Frequent heavier drinkers	3	4	6	6	4	3	7	9
N	(192)	(230)	(213)	(281)	(722)	(343)	(93)	(177)

Table 16.—Drinking patterns among women by degree of urbanization and race, in weighted percents

	Metropolitan cities of 50,000 or more		Metropolitan cities of less than 50,000		Nonmetropolitan areas	
Pattern	Black	White	Black	White	Black	White
Abstainers	42	28	42	28	58	46
Infrequent drinkers	17	17	19	22	12	19
Less frequent low maximum drinkers	14	19	22	15	13	9
Less frequent high maximum drinkers	5	8	4	6	2	7
Frequent low maximum drinkers	11	12	8	16	7	9
Frequent high maximum drinkers	6	9	1	9	4	6
Frequent heavier drinkers	5	7	4	3	4	5
N	(715)	(307)	(267)	(393)	(242)	(334)

may affect the distribution of drinking patterns in the black population.

Drinking problems. Table 17 presents preliminary data on the prevalence of drinking problems over the preceding 12 months for respondents classified as current drinkers (consumed one or more drinks of alcoholic beverages over the past year). The percentages are based on the number of respondents reporting one or more items under each problem type.

The findings for males illustrate that for every type of problem, with the exception of drinking and driving, blacks report higher rates than whites. This finding is particularly interesting given the fact that a slightly smaller proportion of blacks were classified as frequent heavier drinkers. It suggests that other factors (e.g., number of times drunk or socioeconomic status) may contribute to high problem levels. The excess in black rates was particularly marked for acute and chronic alcohol-related health problems. Nearly 2.5 times as many blacks as whites reported binge drinking (4.0 percent versus 1.6 percent) and health problems (15.3 percent versus 6.4 percent). Substantially more blacks than whites also indicated experiencing symptoms of physical dependence (e.g., tremulousness, sweating, morning drinking) (17.1 percent versus 9.9 percent) and loss of control (17.8 percent versus 13.7 percent). There were fewer differences between black and white men in how many reported social and interpersonal problems. In fact, one of the more striking findings is that over 2.5 times as many whites as blacks reported driving while drunk (27.2 percent versus 10.4 percent). These data are consistent with health statistics and arrest figures, which show that while racial differences are narrowing on social indicators of problem drinking, the gap is widening for alcohol-related morbidity and mortality.

The racial distribution of drinking problems shows a different relationship among women. In general, black women report fewer alcohol-related problems of any type compared with white women. The differences are especially strong for the proportion of black versus white women reporting driving while drunk (2.1 percent versus 10.8 percent), belligerence (4.7 percent versus 8.6 percent), and financial problems (1.0 percent versus 2.7 percent). The low rate of alcohol-related problems for black women in this sample differs from previous studies which suggested that they exhibit much higher rates of alcoholism than white women.

When the relationship between men's drinking problems and age was examined, blacks and whites showed some important differences. Paralleling the

Table 17.—Prevalence of current problems by sex and race among current drinkers, in weighted percents

Problem	Males		Females	
	Black	White	Black	White
Financial problems	5.4	4.0	1.0	2.7
Accidents	2.0	1.7	.5	.5
Binge drinking	4.0	1.6	.8	1.1
Loss of control symptoms	17.2	11.2	7.6	7.6
Physical dependence symptoms	29.5	9.9	3.9	4.8
Health problems	15.3	6.4	7.7	7.3
Belligerence	15.3	13.2	4.7	8.6
Job problems	6.3	4.3	1.2	1.7
Police problems	6.0	4.3	.9	1.2
Drunk driving	10.4	27.2	2.1	10.8
Spouse problems	13.5	11.6	4.3	5.1
People problems	13.8	9.0	3.7	5.3
Total problems[a]	37.6	31.2	15.7	17.8
Proportion frequent heavier drinkers	21.0	25.0	8.7	7.3
N	(498)	(568)	(635)	(665)

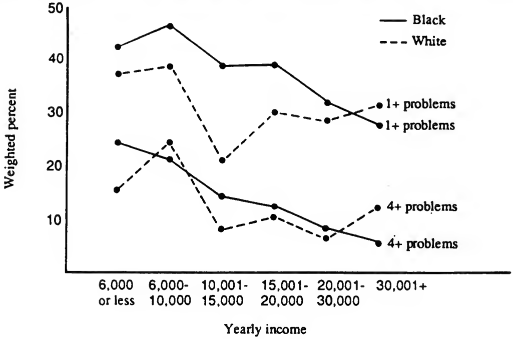
[a] Excludes drunk driving.

relationship between age and frequent heavier drinking described in the previous section, blacks in the youngest age group (18-29) were at least risk for experiencing drinking problems, and whites in this age group were at highest risk.

For men reporting one or more alcohol problems, rates among whites over 29 years old declined sharply, then rose in the 40-49 year age group, and rapidly declined for older men. Among blacks, problem rates increased considerably for men in the 30-39 year age group. After age 39, rates decreased, but the decline was much more gradual than it was for whites. In fact, the level of problems among blacks remained higher than that of whites throughout middle and old age. For men indicating a more severe level of problems, greater differences occurred between blacks and whites. After age 29, black men experienced sharp increases in problem rates. These rates decreased slightly for men between 40 and 49 and then rose steeply for those between 50 and 59. Only black men over 59 years old showed considerable declines in rates of severe alcohol problems. In contrast, drinking problems among white men declined dramatically between 30 and 39, increased considerably in the 40-49 year age group, and then began a consistent decline among the elderly.

The relationship between alcohol problem rates and family income level shows major similarities and differences for black and white men (figure 8). In both races, the overall prevalence of alcohol-related problems is highest among men with relatively low incomes. Among blacks, as income increases, rates of problems steadily decline. However, among whites, after taking a steep plunge at the middle income level ($10,000-$15,000 yearly), the proportion of men experiencing problems rises quite dramatically in the next income bracket and continues to increase at higher income levels. Despite the different patterns of association, at every income level blacks appear to be at more risk for

Figure 8. Alcohol-related problems among current male drinkers by yearly family income



alcohol-related problems than whites, except for those blacks with incomes over $30,000 per year. For men reporting more severe alcohol-related problems, the proportion of problems at different income levels is very similar for blacks and whites. However, blacks and whites differ somewhat in the way income is associated with level of problems. Among blacks there is a strong, steady decline in the proportion of those experiencing problems as income increases. In contrast, among whites the prevalence of problems goes up for men with incomes of $6,000 to $10,000 per year and for those with incomes over $20,000 yearly.

In general, the regional distribution of alcohol-related health problems appears similar for black men and white men. Both groups of men share patterns of high rates in the South and West and low rates in the North Central area. The major difference between the two groups is that in every geographical region except the West, blacks exhibit a much higher proportion of problems than whites. This disparity appears particularly strong in the South. To some extent, this finding parallels the data on drinking patterns which show that rates of heavy drinking are particularly high among black men in the South.

In summary, preliminary results from the national survey suggest that black men experience a much higher prevalence of alcohol-related health problems than white men despite similar rates of overall alcohol consumption. Important variations in the prevalence of problems for the two groups of men were also described by age, socioeconomic status, and geographical region. Among black men, problem rates are highest for those over 30 years old, for those with low incomes, and for those residing in the South. In contrast, the prevalence of alcohol problems for white men is greatest for those aged 18 to 29, at both low and high income levels, and for men residing in the West. In general, the national survey data suggest that black women exhibit lower rates than white women of alcohol-related problems, particularly in the areas of drinking and driving and some social problems.

Surveys of Drinking Patterns and Problems Among Youth and College Students

Studies of Adolescents

Until recently, the literature on black drinking practices argued that blacks were "precocious" in adopting lifestyles of heavy and problem drinking.

Alcohol was believed to be pervasive in ghetto environments, leading to the early and widespread initiation of black youth into adult drinking patterns (Sterne and Pittman 1972). These patterns were seen as a precursor to blacks' involvement in alcoholism treatment and contact with alcohol agencies at younger ages than whites (Robins et al. 1968). However, surveys of youth in the general population have been consistent in showing that fewer black than white adolescents drink at all and that those who do drink get drunk less often and have lower rates of heavy and problem drinking than whites.

Blane and Hewitt's (1977) review of the literature on adolescent drinking from 1960 to 1975 reported that most surveys of black youth showed that they were less likely to use alcohol or to experience problems related to drinking. Surveys of high school students usually indicated lower rates of lifetime and current alcohol use, lower drinking frequency, and lower rates of problem drinking. Similar findings were reported for black youth respondents in household general population surveys and in a study of selective service registrants. The results of studies on delinquent and problem youth were less consistent–with some showing higher rates of heavy and problem drinking among blacks than whites. But even in this population, the review concluded that overall use rates were lower among black than white high school students.

Studies of adolescents published since this review continue to report lower rates of drinking among blacks. A national survey of drug use among the youth and adult population (Fisburne et al. 1980) found that black youths aged 12 to 17 were less likely to be current drinkers than whites (29 percent versus 38 percent) and that the proportion of drinkers among blacks increased less than among whites over a 5-year period (10 percent versus 14 percent). A nationwide survey of youth in secondary schools (grades 7-12) (Wilsnack and Wilsnack 1978) found that black girls and boys were more likely to abstain than white, Spanish American, or Native American youth across all grade levels. In grades 11 and 12, only 44.2 percent of black girls reported drinking in comparison with 67.7 percent of whites, 53.9 percent of Hispanics, and 61.2 percent of Native American girls. The same pattern held for males. Only 63.3 percent of black males were drinkers, compared with 80.4 percent of whites, 84.1 percent of Hispanics, and 72.3 percent of Native Americans. Blacks also ranked low on mean quantity-frequency scores and scores of symptomatic drinking. Wilsnack and Wilsnack (1980) reported that drinking was not as predictive for problems with achievement motivation or sense of responsibility among blacks, Jews, or Catholics as among the majority population.

A recent analysis of a nationwide survey of senior high school students examined the drinking patterns of a representative sample of 496 black students (Harford et al. 1982). The results of the study showed that greater proportions of black boys (34.3 percent) and girls (40.6 percent) abstained or used alcohol less than once a year when compared with white boys (19 percent) or girls (23 percent). Blacks also reported higher rates than whites of infrequent drinking. Although the study found that black students' drinking levels were influenced by demographic factors (grade level, sex, geographical region) and academic performance, these factors failed to completely explain the difference between white and black drinking patterns. The study concluded that important stylistic differences exist between blacks and whites in the use of alcohol and other drugs which relate to a delay in onset of drinking among black youth.

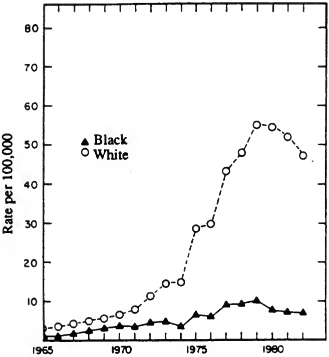
Youth and Criminal Offenses Related to Alcohol

Data on arrest rates for alcohol-related offenses for youth under 18 years of age offer strong support for the findings from general population surveys which show that black adolescents and high school students abstain more, drink less frequently, and drink lower quantities of alcohol than whites (figure 9). These data reveal that rates for blacks are currently far below those of whites and that, over time, rates for white youth have increased much more dramatically than those for blacks.

In 1965, black rates for driving under the influence among those under 18 were about half the rates of whites (1.2 versus 2.8 per 100,000 population). Over the years, particularly after 1974, rates among both groups increased greatly, but increases for whites were much higher than for blacks. Between 1965 and 1979, the rate for blacks increased about ninefold (from 1.2 to 10.4 per 100,000 population), but in the white population, rates increased almost 20 times above their former level (2.8 to 54.8 per 100,000 population). Currently, rates for whites are more than six times higher than for blacks (46.8 and 7.2 per 100,000 population, respectively).

Changes in arrest rates for liquor law violations show a similar pattern (figure 10). In the mid-1960s, rates among white youth were about 2.5 times in excess

Figure 9. U.S. arrest rates for driving under the influence among persons under 18 years by race, 1965-1982



Year of arrest

Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

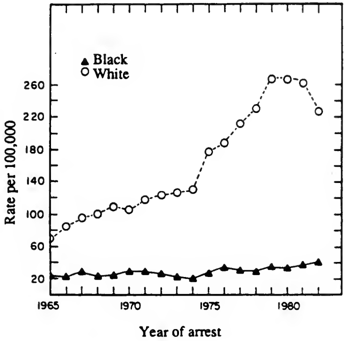
of those for blacks, or 70.9 versus 23.0 per 100,000 population. Between 1965 and 1982, rates among blacks almost doubled, but in the white population during the same period, the rates nearly tripled. In 1982 rates for whites were nearly six times higher than those in the black population (218.8 versus 41.3 per 100,000 population).

Arrest rates for drunkenness exhibit a different pattern, yet they also illustrate the strong predominance of white alcohol-related offenses (figure 11). Since 1965, black arrest rates have fluctuated, showing modest increases in the late 1960s and early 1970s, but eventually declining to about half their initial level. In 1965, black arrest rates for drunkenness were 31.2 per 100,000 persons; yet by 1982, the rate had fallen to 17.9 per 100,000 population. In contrast, rates among whites have shown steady increases over time. By 1977, rates among whites had more than doubled, from 35.0 to 85.5 per 100,000 population. Since that time, white rates have declined, but they remain considerably higher than those for blacks (60.7 versus 17.9 per 100,000 population).

College Student Surveys

Earlier studies of college drinking indicated either that black males and white males exhibited similar drinking patterns (Straus and Bacon 1953) or that blacks were more likely than whites to be heavy drinkers (Maddox and Williams 1968). Reported rates of problems and social complications due to drinking were similar between the two groups, although blacks were believed to be more "preoccupied" with alcohol and to experience more feelings of ambivalence and low self-esteem about drinking (Maddox and Borinski 1964).

Figure 10. U.S. arrest rates for liquor law violations among persons under 18 years by race, 1965-1982



Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

More recent studies, however, report findings that are consistent with the low rates of drinking described for black high school age youth. Engs' study (1977) of 13 colleges included 2 predominantly black colleges, leading to the inclusion of 194 blacks in the study. The findings revealed that considerably more whites (84 percent) than blacks (60 percent) drank and that about three times as many whites as blacks appeared to be heavy drinkers. When the findings were broken down by sex, they showed moderate differences in overall rates of drinking and striking differences in rates of heavy drinking among males. More white men (86 percent) than black men (72 percent) reported drinking at least once a year and over four times as many white men as black men were classified as heavy drinkers (22 percent versus 5 percent); yet approximately the same percentage of white women (5 percent) and black (4 percent) women were reported to be heavy drinkers.

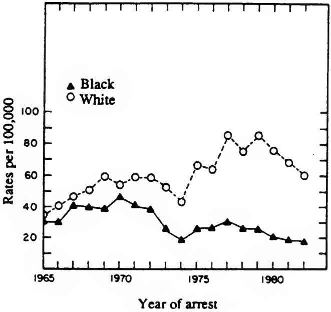
A survey of drug use (Strimbu et al. 1973) in a large southeastern university system echoed these findings. Overall, blacks were less likely than whites to use alcohol and drugs. Blacks in predominantly white schools were more likely to be drinkers than those in black schools.

The apparent shift in black college drinking patterns may be a reflection of changes in the students. First, the change may reflect cohort differences in rates of heavy drinking, where drinking was more popular for youth in earlier decades. Second, the shift may stem from changes in the socioeconomic status of black college students as this population has expanded from a small well-to-do group in the 1950s to a more diverse group which includes middle-class and working-class blacks.

Norms and Values Regarding Alcohol Use

Blacks, like other Americans of Protestant and rural southern heritage, exhibit polarization in atti-

Figure 11. U.S. arrest rates for drunkenness among persons under 18 years by race, 1965-1982



Sources: Federal Bureau of Investigation, *Uniform Crime Reports* (1966-1983); U.S. Bureau of the Census, *Current Population Reports* (1965-1983).

tudes towards alcoholic beverage use. This polarization is evident in the disparate images which have emerged regarding black drinking. The first, drawing on popular stereotypes and anthropological studies of ghetto life (Hannerz 1970; Liebow 1967; Lewis 1955), characterizes drinking and drunkenness as prominent and thoroughly integrated features of black life.

In contrast, other studies suggest that antialcohol attitudes are pervasive in the black population. Borker (1980) found ambivalent or even hostile attitudes towards alcohol use among lower- and working-class San Francisco blacks from fundamentalist backgrounds. The study concluded that among blacks there may be many norms restricting the use of alcohol and general acceptance of abstinence or infrequent drinking by community members. A previous ethnographic study of a St. Louis housing project (Sterne and Pittman 1972) drew similar conclusions. The authors suggested that although alcohol was "near-successfully" integrated into black culture, liquor was negatively regarded and subject to ambivalent norms even among informants who were regular drinkers.

Support for both perspectives–that black culture prescribes attitudes for heavy drinking *and* for abstaining–is evident in the previous review of survey data and social indicators of drinking patterns and problems. The findings illustrate that a significant portion of the population abstains, but that heavy drinking and high rates of alcohol problems are prominent in some subgroups.

A recent analysis by Herd (1985*a*) suggested that the "two worlds" of drinking in black life stem from historical changes in the shift from the temperance-oriented values of the 19th century to the emphasis on liquor and the nightclub culture in the Prohibition era. The Protestant church, especially among its fundamentalist branches, has retained its sanctions against alcohol use and continues to be a force for abstinence in the black community. The orientation towards abstinence extends to church-based self-help groups and even to secular organizations for self-improvement (Borker 1980).

The importance of religious values in shaping black perceptions of alcohol use are illustrated by data from an anthropological study of black drinking patterns among urban blacks (Herd 1980). Respondents from fundamentalist backgrounds reported a pattern of nondrinking by parents and female relatives. These informants reported that alcoholic beverages were seldom kept at home or served with meals and were used only during holidays or special events. The respondents' current attitudes towards alcoholic beverage use were often quite ambivalent. Even among drinkers, alcohol was described as a potent and dangerous substance.

In addition to negative attitudes towards alcohol itself, negative attitudes towards drunkenness have been described as characteristic of blacks in anthropological studies (Borker et al. 1980; Sterne and Pittman 1972). These studies report great emphasis on maintaining self-control in drinking situations and minimizing social disruption due to drinking among blacks.

Although antialcohol sentiments are sanctioned and reinforced in many black social contexts, the focus on drinking establishments and alcohol use associated with the nightclub culture during and after Prohibition also has left a lasting impression on black social life. Bars, taverns, and nightclubs have retained an important place in black society because they provide a context for sociability, dancing, and music. Alcohol is intrinsically associated with these establishments, as it is with informal contexts–such as house parties–which have the same focus. In these settings, drinking alcohol is regarded as an important symbol of sociability and pleasure (Borker et al. 1980).

As a legacy from Prohibition, liquor also plays a key role in the economy of black communities. Off-sale liquor establishments are regarded as one of the most viable forms of individual entrepreneurship available to blacks (Mosher and Mottl 1981). The liquor industry views blacks as a primary market for distilled liquors and thus is very visible through advertisements and promotional campaigns in local and national black publications.

Summary

This review has examined a range of health and social indicators of alcohol problems among the U.S. black population. Included are physiological consequences such as alcohol-related morbidity and mortality as well as psychosocial indicators such as records on hospitalization or treatment for alcohol problems, arrest statistics, and self-reported social problems due to drinking.

The findings of the review illustrate that, except for the youth population, blacks are overrepresented on most indirect measures of alcohol problems. However, there is considerable variation in the level of disparity between blacks and whites on different types of problem indicators and variation in whether indicators of specific problems have been declining or rising in recent years.

Medical problems associated with heavy drinking have increased dramatically in the black population. Rates of acute and chronic alcohol-related diseases among blacks, which were formerly lower than or similar to those among whites, have in the postwar years increased to almost epidemic proportions. Currently, blacks are at extremely high risk for morbidity and mortality for acute and chronic alcohol-related diseases such as alcoholic fatty liver, hepatitis, cirrhosis of the liver, and esophageal cancer.

The literature has pointed out that heavy alcohol consumption, both in the past and the present, is a strong predictor of increases in alcohol-related diseases (Schmidt and de Lint 1972; Skog 1980; Bruun et al. 1975). With reference to past alcohol consumption patterns, Herd's research (1985*c*) has described the shift in black cultural attitudes towards alcohol which has led to alcoholization in many urban black communities since the repeal of Prohibition. The significance of these historical shifts was affirmed in an epidemiological analysis (Herd 1985*b*) which showed the importance of cohort changes in mortality patterns and demographic shifts–such as urban migration–in partially explaining the rise of liver cirrhosis among blacks. An analysis of contemporary black drinking patterns suggested that blacks may be at greater risk for physiological diseases due to a later onset and more prolonged pattern of heavy drinking than whites.

Aside from alcohol consumption level, other factors which may be important in explaining the high rates of alcohol-related diseases for blacks have not been specifically explored. These factors include the possibility that high hepatitis rates, inferior nutritional status, and low socioeconomic status may be leading to substantial increases in morbidity and mortality among blacks who drink heavily. The rise of medical problems related to alcohol use in the black population reflects a widening disparity of problem rates between blacks and whites.

In contrast, some social indicators have shown a relative decline in black predominance and a convergence of black with white rates. This trend has been observed with statistics on arrests for alcohol-related offenses. Arrests for drunkenness have decreased more substantially for blacks than for whites, making the two groups more similar in rates than they were in the 1960s. Although black rates are still significantly higher than those for whites, the disparity between the two groups has lessened. Arrest rates for violation of liquor laws have also declined for blacks but have increased in the white population, making rates between the two groups very comparable. Among both blacks and whites, arrest rates for driving while intoxicated have increased substantially, but the increase in white rates has been twice that of blacks. Arrest rates for driving under the influence for blacks are now almost identical to rates for whites.

The decline of black predominance in arrest statistics seems to be related to general changes in the social and legal response to alcohol problems. These changes include the decriminalization of public drunkenness and expansion of alcohol detoxification and treatment centers. Legal responses refer in part to the increases in drinking and driving legislation and the rise of grassroots and antidrunk-driving movements. The changing legal response to alcohol problems has made white drinking drivers more vulnerable to arrest, thus helping to equalize black and white arrest rates.

Black Americans are currently overrepresented in the alcohol treatment system, particularly in the urban areas of the Northeast. The excess involvement of blacks in the alcohol treatment system is consistent with the high rates of psychiatric hospitalization for alcohol problems described for urban migrant blacks in earlier decades. Within the current alcohol treatment system, blacks appear to be modestly overrepresented in programs emphasizing voluntary treatment for working-class or middle-class people such as employee assistance programs. In contrast, they appear greatly overrepresented in programs designed for persons in the lower socioeconomic strata, such as public inebriates.

Data on self-reported drinking patterns from general population surveys have shown that at the aggregate level black men and white men appear to have similar drinking patterns. Black women differ from white women in exhibiting higher rates of abstinence and lower rates of frequent drinking.

Results from the recent national survey of black and Hispanic drinking patterns also revealed that there are major differences between blacks and whites in the age groups associated with heavy drinking and in the relationship between drinking patterns and some social and demographic factors. The findings reveal that blacks in the younger age groups are at substantially less risk for high rates of heavy drinking than younger whites and suggest that there may be important racial differences in the etiology of heavy drinking among the two groups.

Despite the similarity in rates of frequent heavier drinking among black and white males, black men exhibit a higher prevalence of all types of alcohol-related problems, except for drinking and driving. Echoing the findings of indirect alcohol problems indicators, the disparity for blacks and whites was greatest for acute and chronic alcohol-related health problems. Substantially more blacks than whites reported experiencing symptomatic drinking or medical problems related to drinking, while the racial gap was much narrower for interpersonal and social problems. In fact, a much higher proportion of whites than blacks reported driving while intoxicated.

Substantial differences in the age distribution of alcohol-related problems were reported for black and white males. Paralleling the differences described for drinking patterns, alcohol-related problems were low among blacks in the youngest age group and high for whites. It is only after age 29 that alcohol problems began to rise in the black population while they were declining for whites. Except for young adults, blacks at all ages appear at higher risk for alcohol-related problems than whites. Despite the fact that blacks appear to exhibit high rates of alcohol-related problems at older ages than whites, much of the literature suggests that the treatment population of blacks with alcoholism and similar disorders seems considerably younger than the white population. This apparent anomaly may stem from differences in the social and economic background of the treatment population when compared with the population of respondents in general population surveys.

Rates of alcohol-related problems among black men appear to be greatly influenced by low socioeconomic status. Those with high problem rates are in the lowest income categories, and as income rises, the proportion of men experiencing problems drops incrementally. In contrast, among whites the association of alcohol problems with socioeconomic status appears more curvilinear, with those at both low income and high income levels at greater risk for alcohol-related problems.

The analysis of drinking patterns and problems by geographical region revealed that the South, which was formerly noted for low rates of heavy drinking and alcohol-related problems, is now an area where heavy drinking and extremely high rates of alcohol-related problems appear common among black males.

The findings from the national survey on black women's drinking problems depart greatly from former studies which showed high rates of black female alcohol problems and a lower male-to-female ratio for heavy drinking and alcoholism than the white population. In the national survey data, black women drinkers exhibited lower rates than white women of alcohol-related problems of all types. The disparity between the two groups of women was greatest for social problems and drunk driving. Further analysis of data from the national survey may reveal higher levels of problems among black women in certain regional and socioeconomic strata.

Implications for Research

Planning effective intervention strategies for alcohol-related problems in a special population group requires a good base of knowledge about the etiology of such problems in the particular population. For the most part, this kind of knowledge is lacking with respect to blacks. There are few indepth studies which examine alcohol-related problems or diseases among blacks. Most existing analyses rely on studies with very small subsamples of blacks or on data gleaned from aggregate statistics. Rarely do these studies provide enough information to understand the specific processes related to the development of alcohol-related problems.

Three broad areas of research need to be greatly expanded in the black population. First, more clinical and epidemiological studies on alcohol-related diseases need to be conducted. These studies are needed to provide insight into the contributions of alcohol consumption and other risk factors to disease. Establishing relative risks for consumption is important for determining safe levels of alcohol beverage use. This information is particularly important given the national survey data which suggest that black men are at increased risk for alcohol-related problems despite roughly similar rates of alcohol consumption as white men.

Second, research data on blacks from alcohol problem reporting systems need to be made more available. Although data on race and ethnicity may be collected in these systems, this information is often omitted when the data are reported or analyzed. More complete data on the racial breakdown of alcohol-related accidents, suicides, treatment, hospitalization, and related topics are needed to assess the magnitude of black alcohol problems and to plan interventions.

Third, much more research on the social and cultural factors influencing the etiology of heavy alcohol consumption and alcohol-related problems among blacks should be implemented. For example, the age of transition into heavy drinking is a key problem in the literature on black drinking. Currently, blacks in early middle age appear to be at high risk for social problems related to alcohol use. However, it is not known whether this pattern is related to specific socialization or maturational features in black culture which delay age of drinking or to "cohort effects" or historical events which make blacks in this age group more vulnerable to drinking. If this phenonenon is more related to historical effects than to maturational differences in drinking, it may mean that high rates of heavy drinking will persist in the older age groups as this cohort ages. Knowledge about the social factors which influence age of drinking and patterns of socialization to drinking thus hold implications for the populations and the social forces to be addressed in intervention measures.

A related concern regarding the transition into heavy drinking involves the question of why blacks in alcoholism treatment are so much younger than whites. In contrast to the youthfulness of blacks in alcoholism treatment, numerous studies showed that black youth in the general population are, on the whole, at much lower risk for drinking, drunkenness, and arrests for alcohol-related offenses. Examining this issue has important implications for determining which youth populations are at risk for developing alcohol problems and designing appropriate strategies for intervention.

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Alcohol Use Among Black and White Teenagers

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ABSTRACT

This paper describes drinking patterns and alcohol-related problems among black and white teenagers. Surveys of high school students indicate that alcohol abstinence rates are higher for black than for white teenagers and that lower proportions of black teenagers are heavy drinkers. The 1978 National Survey of Senior High School Students revealed that the lower prevalence of heavier drinking among black teenagers persisted when relevant demographic variables were controlled. The findings further suggested that the onset of drinking among black teenagers, relative to other students, appears to be delayed. Based on the 1978 survey, data are presented here with respect to several measures of alcohol use, the contexts in which alcohol is used, and the attitudes related to alcohol use.

Introduction

Reviews of the literature and recent national surveys indicate lower rates of lifetime and current alcohol use among black high school students compared with all other students (Blane and Hewitt 1977; Rachal et al. 1975, 1980; Fishburne et al. 1979; Bachman et al. 1981). The differences in alcohol use persist when demographic and other correlates of use are controlled, at least for national estimates of high school seniors (Bachman et al. 1981). Among students at other grade levels, national studies have failed to adjust the prevalence levels by factors known to relate both to alcohol use and to differences between racial/ethnic groups.

While surveys consistently reveal that the level of alcohol use increases with age and grade in school and is higher among males than females, several other variables have been shown to influence alcohol use (Harford and Spiegler 1982; Spiegler et al. 1985). For example, religiosity has been shown to function as a personal control against transgression and is an important antecedent in structuring the exposure to drinking environments among youth (Donovan and Jessor 1978). The conservative or Protestant upbringing of many blacks may be an important factor in accounting for differences in drinking levels of these students. Similarly, lower levels of alcohol consumption have been reported for teenagers living in southern geographic regions, an area with a high concentration of blacks. School performance has also been shown to relate to levels of drinking. Students who attain higher academic status reported lower levels of alcohol use (Blane and Hewitt 1977; Rachal et al. 1975, 1980).

The objective of this paper is to estimate the level of difference in alcohol use among white and black students by grade in school when pertinent variables such as degree of religiosity, regional variation, socioeconomic status, and academic performance are statistically controlled. The relationships between these two groups of students on several measures of alcohol use are examined along with the social contexts in which alcohol is used and attitudes related to alcohol use.

Materials and Methods

Survey Design

Data were obtained from a cross-sectional survey comprising a nationally representative sample of senior high school students grades 10 through 12. They were selected from each of 74 senior high schools in the 1977-1978 academic year. The sample was stratified to provide national estimates of alcohol use.

The primary sampling frame consisted of all county units in the 48 coterminous States and the District of Columbia. The primary sampling frame was stratified by geographic region and by the size of the community. Within each of 50 primary sampling units (PSUs) selected, a sampling frame consisting of all senior high schools was constructed, and at least one high school was selected from each PSU. For PSUs with relatively large populations, additional high schools were selected. Of the 75 schools originally selected for the sample, 28 (37.3 percent) were lost to the sample due to refusals to cooperate by State or local school officials. The schools lost through refusals at the district level were replaced using probability measures. If no replacement schools had been selected, the estimated response rate based on the original sample would have been about 55 percent; if the replacement schools are assumed as equivalent, the survey response rate would have been 87 percent. For one PSU, refusal occurred too late for a replacement; thus, only 74 schools actually participated in the study.

Within each of the 74 schools selected, one 10th, one 11th, and one 12th grade homeroom or class was designated for the sample. All students in the selected homeroom or class were defined as being in the sample, and an attempt was made to include them in the survey. The sample size in the 222 homerooms in the 74 schools was 5,638. Of these, 4,918 (87.2 percent) students completed study questionnaires. Additional detail on the survey design for the 1978 National Survey of Senior High Students may be found in Rachal et al. (1980).

Subjects

The present analysis was restricted to those students who classified themselves as "black, not of Hispanic origin" (N = 496; 10.1 percent of the total sample) or as "white, not of Hispanic origin" (N = 3,792; 77.1 percent of the total sample).

Instrumentation and Alcohol Measures

A 37-page self-administered questionnaire was given to the selected classes of students for completion during regular school hours and in the school facilities. Measures of alcohol consumption were obtained from questions about the frequency and quantity of use of each of three types of beverage alcohol: beer, wine, and hard liquor. Response choices for beverage-specific questions about the typical frequency of alcohol use included: every day, 3-4 days a week, 1-2 days a week, 3-4 days a month, once a month, less than once a month but at least once a year, less than once a year, or never. Response choices for beverage-specific questions about the quantity of alcohol consumed (cans of beer, glasses of wine, drink(s) of hard liquor) included: 12 or more; about 9, 6, 5, 4, 3, 2, or 1 drinks; less than 1 drink; or do not drink.

Based on these beverage-specific measures, the mean average absolute alcohol per day (in ounces) was calculated for all beverages as developed by Rachal et al. (1975). While this measure is useful in statistical analysis, it does not provide a meaningful scheme for the classification of drinking levels. For this reason, each of the above beverage-specific frequency items was organized into the following two categories: (1) percent of students who report drinking once a week or more, and (2) percent of students who report drinking once a month or more. These weekly and monthly prevalence categories are common units in alcohol and drug surveys of teenagers. The beverage-specific quantity items were categorized as follows: (1) percent of students who report drinking five or more drinks at one time, on the average, and (2) percent of students who report drinking three or more drinks at one time, on the average. The five or more drinks category has been used in surveys to indicate heavier drinking students, and the three or more drinks was selected as a level of low or moderate drinking (one ounce of ethanol or more).

In addition, lifetime prevalence was examined based on the following items from the questionnaire: (1) "Have you ever had a drink of wine, beer, or liquor–not just a sip or taste?" (yes or no), and (2) "Have you had a drink of beer, wine, or liquor more than two-three times in your life?" (yes or no).

Overall recency of alcohol use was measured by the following: "When did you most recently use alcohol?" (i.e., within the last week, within the last month, within the last 2 months, within the last 6 months, more than 6 months ago but within the last year, more than

1 year ago, never use alcohol). On the basis of responses from this question, point prevalence estimates were obtained for drinking in: past week, past month, past 6 months, and lifetime.

Sociodemographic Measures

A measure of social status included the index of socioeconomic status (SES) developed by Rachal et al. (1975) using a combination of parents' occupation and education (0 = low SES to 9 = high SES). SES scores were significantly lower for black students ($\overline{X}$ = 6.25) compared to white students ($\overline{X}$ = 6.8) (F = 33.0, df = 1,4286, $p < .001$). School performance was based upon self-reports of school grades (1 = A to 7 = D, F). White students reported significantly higher grades compared with black students (F = 33.6, df = 1,4286, $p < .001$).

A religiosity index (Rohrbaugh and Jessor 1975) was based on a 5-item scale of the importance placed upon religious teachings, practice, and counsel for the direction of daily life (5 = low religiosity to 20 = high religiosity). Black students reported significantly higher religiosity scores ($\overline{X}$ = 14.4) than white students ($\overline{X}$ = 12.8) (F = 61.8, df = 1,4070, $p < .001$).

Significantly higher proportions of black students (54 percent) compared to white students (25 percent) resided in southern regions of the United States.

Measures of drinking contexts were based on the proportions of students who reported that they drank frequently or most of the time in the following settings: at home with parents, with parents or other adults, with peers only (either at parties, hangouts, or school), and drinking alone. Reasons for drinking were based on the proportion of students who reported the following reasons as "pretty important" or "very important": to have a good time (social), to be like adults (status transformation), to reduce pressures (personal), and to be part of the group (conforming). The questionnaire also included several items related to reasons for not drinking. These included: it tastes bad, it's against my religion, my friends disapprove, it's an artificial way of solving problems, you get involved with the police, you lose self-control, and it makes you sick.

Included in the present analysis are responses to a question about the recency of marijuana or hashish use. Response choices for this question included: within the past week, last month, last 2 months, last 6 months, more than 6 months but within the past year, more than a year ago, and never. The following point prevalence estimates were used for marijuana and hashish: past week, past month, and lifetime.

Analysis Plan

Analyses of covariance, adjusting for socioeconomic status, school performance, religiosity, and geographic region, were conducted for the following drinking measures: most recent use of alcohol, average absolute alcohol per day (in ounces), beverage-specific typical frequency of use, and beverage-specific typical number of drinks per occasion. The statistical difference between the prevalence proportions reported in this paper was tested with the z-ratio at the 0.01 level of confidence with a two-tailed test (Edwards 1960).

Results

Drinking Prevalence

Abstinence and infrequent drinking were higher among black students than white students. Among blacks, 34 percent of the males and 41 percent of the females reported that they either had never used alcohol in their lifetime or drank less than one ounce a year. Comparable figures among whites are 19 percent for males and 22 percent for females. Overall, 20 percent of the black males and 27 percent of the black females (compared with 16 percent for white males and 20 percent for white females) reported that they never drank more than two to three times in their lifetimes.

Table 1 presents various drinking prevalence estimates by gender, race, and year in school. Among males, the total prevalence estimates were significantly higher ($p < .01$) among white students than black students for each prevalence estimate. Similarly among females, the prevalence figures were significantly higher ($p < .01$) for white compared with black students. Among the white students, the prevalence estimates were significantly higher among males compared with females, but only for the less inclusive estimates (i.e., past week and past month). Among the black students, there were no significant differences by gender.

Examination of the prevalence estimates by year in school reveals that the frequency of drinking is grade related. Among white students, the prevalence of drinking for both males and females increased significantly ($p < .01$) with year in school for weekly and monthly prevalence. The vast majority of these students (78 percent) reported alcohol use in the last 6

Table 1.—Drinking prevalence among senior high school students by gender, race, and year in school

Sex/race/ frequency	Year in school (percent)				z-ratios		
	10	11	12	Total	10 versus 11	11 versus 12	10 versus 12
White males							
Past week	39	46	56	47	2.4*	3.5*	5.7*
Past month	56	63	72	64	2.4*	3.3*	5.6*
Past 6 months	76	77	81	78	0.4	1.7	2.0
Lifetime	78	81	84	81	1.3	1.4	2.6*
N	(538)	(612)	(584)	(1,734)			
Black males							
Past week	23	19	32	25	0.6	1.8	1.2
Past month	40	37	47	41	0.4	1.2	0.8
Past 6 months	54	63	58	58	1.1	0.6	0.5
Lifetime	57	67	71	66	1.2	0.5	1.7
N	(61)	(72)	(77)	(210)			
White females							
Past week	29	39	43	37	3.9*	1.5	5.4*
Past month	50	58	64	57	3.0*	2.2	5.2*
Past 6 months	70	75	77	75	2.1	0.8	2.9*
Lifetime	75	79	82	78	1.8	1.4	3.1
N	(708)	(713)	(637)	(2,058)			
Black females							
Past week	22	16	13	17	1.0	0.6	1.7
Past month	30	31	32	31	0.1	0.2	0.3
Past 6 months	42	45	53	48	0.4	1.1	1.5
Lifetime	51	54	69	59	0.4	2.2	2.6*
N	(84)	(81)	(121)	(286)			

*$p < .01$.

months, and there is little variation by year in school. Among black students, there were no significant differences in prevalence by year in school for males, although higher proportions are evident by the 12th grade. Among females, the prevalence of drinking increased significantly ($p < .01$), but only for the more inclusive estimates of lifetime use. The findings indicate that among white students the frequency of drinking is grade related with respect to weekly and monthly drinking. Among black students, the majority appear to be making the transition from abstinence to drinking.

Beverage-Specific Drinking

The results of the covariance analyses for beverage-specific drinking frequency yielded significant main effects for gender, race, and grade for beer and liquor ($p < .001$). There were no significant differences for wine. The findings indicated that the frequency of beer and liquor consumption was significantly higher among males, among white students, and among older students (12th versus 10th grade). There were no significant interactions among the main factors in the analysis. These findings confirm the results of other studies. The frequency of drinking is higher among white students than black students when the following variables are statistically controlled: school performance, socioeconomic status, religiosity, and geographic region.

The results of the covariance analyses for beverage-specific drinking quantities yielded significant main effects for gender, race, and grade in school for all three beverages ($p < .001$). The findings indicate that the typical number of drinks for each beverage was significantly higher among males, among white students, and among older students. There were no significant interactions among the main factors in the analyses. The covariance analyses were also performed on the beverage-specific quantity data using the sample of drinkers only (past year). The number of beers typically consumed was significantly higher among white students and males. Beer quantity did not differ by year in school. There were no significant differences in the quantity of wine consumed by gender, race, or year in school. The number of typical drinks containing liquor was significantly higher among white students and older students. There were no significant differences by gender.

Table 2 presents beverage-specific prevalence for weekly and monthly drinking. Beer is the most preferred and wine is the least preferred beverage based on the proportion of users. The difference in beer and liquor preferences is greater among males than females. Among white students, beer prevalence was significantly higher for males than females. There were no differences for wine or liquor. Among the males, the prevalence of beer increased significantly with year in school. There were no significant changes for wine or liquor. Among females, the prevalence of liquor increased significantly with year in school, but there were no differences for beer or wine.

Among black students, beer prevalence was significantly higher for males than for females. There were no differences for wine or liquor. Among males and females alike, there were no significant changes in the beverage-specific proportions with year in school.

The frequency of drinking was significantly higher among white students compared with black students for beer and liquor. The frequency of wine consumption did not differ by race—a similarity between white and black adolescents that should be noted in light of the many differences which were found for these groups.

Table 3 presents beverage-specific prevalence for two levels of typical consumption: five or more drinks and three or more drinks. Among the white students, both measures of beer consumption were significantly higher for males than for females. Heavier consumption of liquor (five or more drinks) was also significantly higher among males than females. Males did not differ from females with respect to wine consumption or the consumption of three or more drinks of liquor. Beer prevalence estimates at both consumption levels increased with year in school for males but not for females. Wine prevalence estimates did not vary by school year. The proportion of males and females who reported consuming three or more drinks of liquor increased significantly with year in school.

Among black students, the level of consumption was significantly higher among males than females for most of the beverage-specific estimates. The one exception was lighter consumption of liquor (three or more mixed drinks), which was significantly higher among black males. The beverage-specific estimates, with one exception, did not vary significantly with year in school. The consumption of three or more drinks of wine increased significantly for black females between the 10th and 12th grades.

White students did not differ significantly from black students in the consumption of three or more drinks of wine. In all other comparisons, the level of consumption was significantly higher among white students than black students.

Table 2.—Percentage of white and black senior high school students by sex, year in school, beverage type, and drinking frequency

Sex/beverage type/frequency		Year in school							
		White				Black			
		10	11	12	Total	10	11	12	Total
Males									
Beer:	Once a week or more	25	33	41	33	19	15	22	19
	Once a month or more	56	62	69	62	47	47	47	47
Wine:	Once a week or more	5	5	5	5	8	3	10	7
	Once a month or more	27	30	26	28	35	32	22	33
Liquor:	Once a week or more	9	11	12	10	10	6	8	8
	Once a month or more	35	43	45	41	20	20	30	23
	N	(538)	(612)	(584)	(1,734)	(61)	(72)	(77)	(210)
Females									
Beer:	Once a week or more	15	14	21	16	13	8	10	10
	Once a month or more	44	44	48	45	28	19	31	27
Wine:	Once a week or more	7	5	8	6	4	8	7	6
	Once a month or more	34	33	34	34	19	24	36	27
Liquor:	Once a week or more	9	10	14	11	8	5	3	5
	Once a month or more	38	43	52	44	23	19	22	21
	N	(708)	(713)	(637)	(2,058)	(84)	(81)	(121)	(286)
Totals									
Beer:	Once a week or more	19	23	31	24	16	11	14	14
	Once a month or more	49	52	58	53	36	32	37	35
Wine:	Once a week or more	6	5	6	6	6	6	8	7
	Once a month or more	31	32	30	31	26	28	34	29
Liquor:	Once a week or more	9	10	13	11	9	5	5	6
	Once a month or more	37	43	49	43	22	19	25	22
	N	(1,246)	(1,325)	(1,221)	(3,792)	(145)	(153)	(198)	(496)

Table 3.—Percentage of white and black senior high school students by sex, year in school, beverage type, and drinking quantity

Sex/beverage type/ frequency		Year in school							
		White				Black			
		10	11	12	Total	10	11	12	Total
Males									
Beer:	5 or more	29	37	40	37	15	6	14	12
	3 or more	47	54	63	55	27	27	22	26
Wine:	5 or more	12	15	13	13	8	10	8	9
	3 or more	24	28	26	26	28	18	24	23
Liquor:	5 or more	17	18	20	19	3	4	7	5
	3 or more	35	40	44	40	18	13	21	17
	N	(538)	(612)	(584)	(1,734)	(61)	(72)	(77)	(210)
Females									
Beer:	5 or more	11	12	12	12	1	1	0	1
	3 or more	32	29	36	32	5	4	4	4
Wine:	5 or more	11	8	10	10	0	3	3	2
	3 or more	25	26	27	26	7	11	14	12
Liquor:	5 or more	12	10	14	12	1	3	1	2
	3 or more	31	35	43	36	7	9	7	8
	N	(708)	(713)	(637)	(2,058)	(84)	(81)	(121)	(286)
Totals									
Beer:	5 or more	20	25	24	23	7	5	5	6
	3 or more	40	42	48	43	14	16	11	14
Wine:	5 or more	12	11	11	11	4	6	5	5
	3 or more	25	27	27	26	17	14	18	16
Liquor:	5 or more	14	14	16	15	2	3	3	3
	3 or more	33	38	42	38	12	11	12	12
	N	(1,246)	(1,325)	(1,221)	(3,792)	(145)	(153)	(198)	(496)

Table 4.–Average ounces of absolute ethanol consumed among high school students by sex, race, and year in school

	Ethanol per day (ounces)[a]			
	Year in school			
Sex/race	10	11	12	Total
White males	0.44	0.57	0.67	0.57
N	(512)	(579)	(556)	(1,647)
Black males	.22	.21	.57	.34
N	(51)	(64)	(66)	(181)
White females	.31	.31	.39	.34
N	(687)	(689)	(614)	(1,890)
Black females	.16	.29	.13	.18
N	(72)	(72)	(110)	(254)

[a]Unadjusted means.

The results of the covariance analysis of absolute alcohol per day are presented in table 4. The combination of drinking frequency and typical amount of consumption combine to yield significantly higher levels of ethanol per day among white students ($p < .001$), among males ($p < .002$), and among older (12th versus 10th grade) students ($p < .001$). Similar findings were obtained for the sample of drinkers.

Drinking Contexts

Table 5 presents the proportions of students who report drinking most of the time in selected drinking contexts. Significantly higher proportions of white than black students report drinking both with parents and with peers only. There were no significant differences for solitary drinking. Significantly higher proportions of white than black students reported social and conforming factors as reasons for drinking. The largest difference between the two groups of students related to social reasons for drinking.

Table 5 also indicates that white students differed significantly from black students on a number of reasons for not drinking. Higher proportions of black students reported that reasons for not drinking were: it tastes bad, it's against my religion, you lose self-control, and it makes you sick. A significantly higher proportion of white than black students indicated that a reason for not drinking is disapproval by friends.

Discussion

This study examined the use of alcohol in a 1978 national sample of black and white senior high school students. Overall, the evidence indicates that both the frequency of alcohol use and the amount of alcohol consumed per typical occasion are lower among black students than white students when pertinent demographic variables are controlled.

Although alcohol use is lower among black students, patterns of increase in the frequency of use appear to be grade related, especially with regard to the reported onset of alcohol use. Findings indicate that the proportion of black male abstainers decreased with grade in school (from 43 percent in the 10th grade to 29 percent in the 12th grade). Similar decreases were noted for black female abstainers (from 49 percent in the 10th grade to 31 percent in the 12th grade).

The data also suggest there is a corresponding postponement in the onset of heavier drinking among black students relative to white students. Only 12 percent of black male students and 1 percent of black female students reported drinking beer five times or more per typical occasion compared with 37 percent of white male students and 12 percent of white female students. In general, reported typical quantities of beer, wine, or liquor consumed did not change significantly over the three grades for black male and female students. In contrast, there were significant increases with each successive grade in the proportion of white

Table 5.–Proportion of white and black senior high school students by selected drinking contexts and reasons for drinking and nondrinking

	Race				
	White		Black		
	N	Percent	N	Percent	Z-ratios
Drinking context[a]					
At home with parents	3,756	37	470	29	3.50*
With parents and other adults	3,756	44	472	33	4.55*
With peers only	3,759	55	477	31	9.88*
Alone	3,745	6	464	7	-0.8
Reasons for drinking[b]					
Social	3,632	72	428	47	10.6*
Status transformation	3,615	11	421	12	-0.6
Personal	3,612	16	421	16	0
Confirming	3,595	22	417	14	3.78*
Reasons for not drinking[c]					
Tastes bad	3,525	51	414	59	-3.08*
Against my religion	3,539	37	406	43	-2.36*
Friends disapprove	3,509	38	409	27	4.36*
Artificial way of solving problems	3,495	51	403	48	1.14
Getting involved with police	3,508	69	407	72	-1.24
Lose self-control	3,511	74	412	82	-3.54*
Makes you sick	3,507	55	408	68	-5.01*

[a] Proportions are reported for students who indicated that they drink "Most or all of the time."

[b] Proportions are reported for students who indicated these reasons as being "Pretty important" or "Very important."

[c] Proportions are reported for nondrinkers only.

*$p < .01$.

male students who reported beer drinking and white female students who reported liquor drinking. For example, 47 percent of white male students reported typically drinking three or more glasses of beer in the 10th grade compared with 63 percent who drank that amount in the 12th grade. Only 22 percent of 12th grade black males and 4 percent of 12th grade black females reported drinking three or more glasses of beer on a typical occasion, compared with the 63 percent of white 12th grade males and 32 percent of white 12th grade females.

Factors other than demographic status or social differences in use patterns can account for differences in the reported frequency and quantity of alcohol consumption among black and nonblack students. A possible explanation for lower levels of alcohol use among black students is that surveys of school populations exclude school dropouts. If more black students drop out of senior high school than white students, and if a large portion of the black dropouts are heavy or problem drinkers, then perhaps these factors would account for the lower prevalence of alcohol use among black youth than white youth who are in school.

Two problems, however, accompany this explanation. First, while school dropouts have been shown to have high levels of problems associated with alcohol use, studies of institutionalized, delinquent, and school dropout populations are inconsistent with respect to findings on patterns of alcohol use among white teenagers and black teenagers. Some studies report lower rates of problem drinking among blacks, other studies report higher rates, and still others report no differences (Blane and Hewitt 1977). Second, data available from the Bureau of the Census (1979) suggest that the school dropout hypothesis may not sufficiently explain the black-white student differences in drinking prevalence. Census population estimates show that in 1977, school dropout rates for blacks were comparable to that of whites for ages 14-15 years (1.2 percent versus 1.4 percent) and ages 16-17 years (7.6 percent versus 8.8 percent), but were higher among blacks aged 18-19 years (21.9 percent versus 15.9 percent). Considering that about 98 percent of the sample was 18 years old or younger, the differential dropout rates may not have a major effect on the apparent prevalence of alcohol use.

Another possible source of bias that could account for lower levels of alcohol for black students relates to differential underreporting. Black students in predominantly white schools or neighborhoods may be inclined to withhold information concerning their involvement with alcohol. If this were the case, it might be expected that black students in predominantly black schools would be less likely to withhold information on drinking practices than would black students in predominantly white environments. To examine this hypothesis, analyses of covariance were conducted to evaluate the association between the extent of alcohol use and the ethnic composition of the sampled schools, controlling for sex, grade level, region, academic grades, and religiosity. No significant differences were found in reported frequency or quantity of alcohol use among black students in predominantly white schools (i.e., student population less than 25 percent black: N = 148) and those in predominantly black schools (i.e., student population 75 percent or more black: N = 206). Thus, there is no evidence of selective underreporting of alcohol consumption based on ethnic composition of the schools.

While this study provides no definitive explanation of the differences in the prevalence of alcohol use among black and white senior high school students, i does raise some important questions to be resolved by future research. To what extent does the differential socialization to alcohol use of black and white students reflect patterns of familial and community alcohol use? How are patterns of alcohol use related to illicit drug use in the two groups of students? When and under what circumstances do black youth become heavier drinkers?

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Alcohol Abuse in Blacks and Whites as Indicated in the Epidemiological Catchment Area Program

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ABSTRACT

The Epidemiological Catchment Area (ECA) Program is a series of five epidemiological research studies performed by independent research teams in collaboration with the National Institute of Mental Health. This paper presents findings from three ECA sites that provided information on alcohol disorders for 4,026 blacks and 6,711 whites. No difference was found by race in rates of lifetime or current alcohol disorder even when the black population was standardized to white age and sex distributions. However, young blacks had lower rates of alcohol disorders than young whites, and middle-aged blacks had higher rates than middle-aged whites. The male-to-female ratio was higher for whites. While blacks and whites shared behavior problems and early drunkenness as predictors of disorder, whites appeared more sensitive to these predictors. Dropping out of high school significantly predicted alcohol disorders only in young blacks.

A possible explanation for the high rate of disorder in middle-aged blacks might lie in their unique historical experience of being reared in inner cities by parents unfamiliar with city life. This hypothesis could be tested in only one site, but it appeared promising there.

Introduction

The Epidemiological Catchment Area (ECA) Program provides interviews with large population samples of blacks and whites who have been interviewed in detail about their experience with alcohol. A standardized interview has been used that includes the Diagnostic Interview Schedule (DIS) (Robins et al. 1981), which assesses the presence or absence of alcohol abuse and dependence according to criteria of the *Diagnostic and Statistical Manual (DSM-III)* of the American Psychiatric Association (American Psychiatric Association 1980). The DIS assesses lifetime use and abuse of alcohol and the current presence of symptoms of dependence. In addition, the interview provides information about childhood behaviors that have been found to be risk factors for alcohol abuse.

The ECA samples represent residents of both private households and institutions in mental health catchment areas in five areas of the country: Los Angeles, New Haven, Baltimore, St. Louis, and North Carolina. Interviews were conducted from 1979 to 1984. The ECA projects achieved completion rates of 75 to 80 percent. To ensure the representativeness of the sample, those interviewed have been weighted to compensate for study design features, including overrepresentation of the institutionalized population, selection of a single member of each household regardless of household size, and, in some sites, oversampling of the elderly or blacks. In addition, the sample has been weighted to compensate for nonresponse so that the resulting weighted samples are approximately equivalent to the distribution by age, race, and sex of the census tracts sampled. While these weights make the samples representative of the areas sampled, they do not make it representative of the country as a whole.

Because results from the Los Angeles site are not yet available and because data for the New Haven institutionalized respondents are not as yet on the data tape, this paper presents results based on the first of two sets of diagnostic interviews conducted a year apart in three sites: Baltimore, St. Louis, and North Carolina. Each of these sites includes a metropolitan area. In addition, the St. Louis and North Carolina sites include rural areas. In St. Louis, however, the rural areas are almost entirely white.

The numbers of blacks and whites in the ECA samples are shown in table 1, and these formed the basis for the tables that follow. For simplicity in presentation and to ensure reasonable sample sizes in rare categories, the weighted samples were combined for the three sites. Information is provided from interviews with 4,026 blacks and 6,711 whites. Although 37 percent of those interviewed were black, the proportion of blacks in the areas sampled has been reduced to 29 percent by weighting them to their proper representation in the total population.

Before combining sites, the question of whether site contributed substantially to explaining rates of alcohol abuse and disorder for either blacks or whites was explored. Because it was clear that age and sex were very important predictors of alcohol disorders, age and sex were first entered into a logistic regression with lifetime alcohol disorders as the dependent variable; site was then added to see how much it contributed to explained variance. For both blacks and whites, the addition was statistically significant but trivial, explaining less than 0.1 percent of the variance for each race. Therefore, the samples were combined.

The interviews with respect to alcohol symptoms were close to identical in form and content in all sites. However, the sites had slightly different rules about skipping remaining alcohol questions once it became clear that the respondent did not have the disorder. As a result, there are minor differences in symptom coverage and possible, although trivial, differences in sensitivity to the presence of alcohol problems in the diagnostic algorithms. To maximize the equivalence across sites, a standard set of skip-out rules was used, and responses to questions that need not have been asked according to these rules were not considered in the data analysis.

A previous publication based on household samples in New Haven, Baltimore, and St. Louis showed that rates of alcohol abuse and disorder according to *DSM-III* criteria did not differ by race in any of the locations (Robins et al. 1984). Rates of lifetime alcohol disorder varied across sites from 11 to 16 percent for whites, with an average value of 13.4 percent, and from 14 to 15 percent for blacks, with an average value of 14.5 percent. When North Carolina, with a large rural and black population, is substituted for New Haven and when institutional residents are added, results change very little (table 2). The average white rate then becomes 14.3 percent and the average black rate 13.3 percent. The difference is still not statistically significant, and rates of current disorder do not differ by race. Current disorder is defined as having met criteria at some time in one's life and also having experienced at least one alcohol symptom in the past year. Among blacks, 5.6 percent met these criteria, as did 5.8 percent of whites.

This paper has three goals. First, it explores whether the similarity found in rates of lifetime and current diagnoses for blacks and whites also applies to specific symptoms of alcohol disorders. Second, it examines whether racial similarity exists within sex and age groups. Third, the paper attempts to explain the similarity of rates, given the fact that some of the precursors of alcohol abuse are thought to be higher in blacks.

Previous Studies of Precursors of Alcohol Disorders

A great deal of literature on the correlates of alcohol abuse has shown that it is predominantly a male problem (Haglund and Schuckit 1977). One reason for an apparent equality of rates between blacks and whites, therefore, might be a relative dearth of males in the black population. This absence could be attributed either to black males' inaccessibility to interviews or to their premature deaths. Cross-sectional studies are studies of survivors.

It is also well known that alcohol disorders are associated with excess mortality from heart disease, cancer, cirrhosis of the liver, suicide, homicide, and accidents, as well as unexplained deaths or deaths attributable to toxic alcohol doses (Costello 1974). Since alcohol disorders lead to premature deaths, cross-sectional studies underestimate the proportion

Table 1.—Numbers of blacks and whites in the ECA samples

	Total		Behavior problem		Not behavior problem		Drank before age 15		Did not drink before age 15		Nongraduate		High school graduate	
	Black	White	Black	White	Black	White	Black	White	Black	White	Black	White	Black	White
Total	4,026	6,711	707	801	3,319	5,910	444	583	3,636	6,043	2,090	2,789	1,936	3,922
Men	1,547	2,826	426	588	1,121	2,238	305	431	1,224	2,354	849	1,113	698	1,713
Women	2,479	3,885	281	213	1,586	3,672	139	152	2,312	3,679	1,241	1,676	1,238	2,209
<45	2,331	2,881	594	586	1,737	2,295	312	413	2,007	2,452	793	584	1,538	2,297
45-59	584	1,128	52	101	532	1,027	48	80	525	1,041	370	463	214	665
60+	1,111	2,702	61	114	438	2,588	84	90	1,004	2,540	927	1,742	184	960
Males														
<45	935	1,375	352	418	583	957	215	298	716	1,075	359	282	576	1,093
45-59	200	483	32	78	168	405	30	62	167	418	140	203	60	280
60+	412	968	42	92	370	876	60	71	341	861	350	628	62	340
Females														
<45	1,396	1,506	242	168	1,154	1,338	97	115	1,291	1,377	434	302	962	1,204
45-59	384	645	20	23	364	622	18	18	358	623	230	260	154	385
60+	699	1,734	19	22	68	1,712	24	19	663	1,679	577	1,114	122	620

Table 2.–Percentage of alcohol disorders in blacks and whites in three ECA sites

Disorder	Black	White
Ever alcohol abuse or dependence	13	14
Current disorder		
Last month	3	2
Last 6 months	5	4
Last year	6	6
N	(4,026)	(6,711)

of each birth cohort that at some time has had an alcohol disorder. The underestimates can be assumed to be particularly great in cross-sectional samples with a deficit of young and middle-aged men, who are at greatest risk of death from these causes. Therefore, the similarity of white and black male rates in the ECA may be due to a greater risk of death for black alcoholic males than for whites. This increased risk is indicated by our earlier followup of treated samples (Orme et al. 1983).

Alcohol abuse has been shown to be strongly related to childhood behavior. Retrospective and followup studies of general population samples (Rydelius 1983; Vaillant 1983; McCord and McCord 1960; Robins et al. 1968), as well as of child guidance clinic patients (Robins 1966), have shown a striking association between deviant behavior in childhood and later drinking problems. It is also well known that official delinquency (Wilson and Herrnstein 1985) and school problems (Coleman et al. 1966) are disproportionately high in blacks. One might therefore expect a higher rate of alcohol abuse in blacks. Since alcohol disorders are not higher in blacks, one might postulate that (1) childhood deviance predicts alcohol abuse more strongly in whites than blacks so that the higher rate of deviance in blacks is compensated for by its lesser impact or (2) that childhood deviance is particularly associated with early death for blacks, and therefore the rates of childhood deviance do not differ in black and white survivors; these rates should continue to exist, however, in young men who have not yet been fully exposed to the risk of death associated with childhood deviance.

Another well-established finding is that early onset of drinking is associated with the development of problem drinking. A recent paper (Robins et al. 1987) has shown that this phenomenon is additive with the effect of delinquency.

Another familiar element in the prognostication of deviant adult behavior of all kinds, including alcohol problems, is dropping out before completing high school (Robins and Ratcliff 1980). However, completing high school has become an expectable standard behavior only for recent generations. Leaving school early was common in both races a generation or two ago, particularly among blacks, many of whom were reared in the rural South, where school facilities were limited for blacks. Furthermore, adolescents were needed by their families to do farm work. Thus, the power of dropping out of school as a predictor of alcohol disorders is expected to be weaker for older than younger persons because it was less a violation of norms. Dropping out of school is an especially weak predictor for older blacks, who had little choice but to drop out. Among young cohorts, for whom graduation is the norm, blacks have had a higher dropout rate than whites and should therefore be at greater risk for alcohol problems.

Results

Black-White Similarities in Alcohol Symptoms

The first goal is to learn whether blacks and whites share similar patterns and frequency rates of alcohol symptoms. Table 3 shows the frequency of symptoms in blacks and whites. The largest difference is for blackouts, which occurred in 8 percent of whites and only 4 percent of blacks. Rates for all other symptoms

Table 3.–Frequency of alcohol symptoms in blacks and whites, in percent

Symptom	Black	White
Fifth in 1 day	11	15
Family objected	12	12
Fought while drinking	6	9
Heavy daily drinking	7	7
Blackouts	4	8
Driving problem	7	6
Nonfamily objections	6	5
Arrest	5	5
Binges	4	4
The "shakes"	5	3
Drank before breakfast	4	3
Unable to stop	4	3
Made rules to control	3	3
Drank despite medical contraindication	2	2
Job problem	1	2
Need drink to function	2	1
Lost job	1	1
N	(4,026)	(6,711)

differed by no more than 3 percent. The correlation between the rank order of symptoms in the two races is .88. For both groups the most common symptoms were drinking a fifth or its equivalent in one day and complaints from family members. For both, the least frequent symptom was job loss due to drinking. It is concluded, therefore, that blacks not only have the same rate of alcohol disorders as whites, but their pattern of symptoms is almost identical as well.

Explaining Black-White Similarities in Disorder Rates

The similarity between blacks and whites might be due to differences in the sex-age structure of the two samples, with the scarcity of older black males in particular compensating for the higher rate of behavioral predisposing factors. The black sample, as anticipated, is younger than the white sample and has a greater excess of females, reflecting the lower life expectancy of blacks, particularly black males. Among blacks, 66 percent of the sample were under age 45, compared with 53 percent of the whites. Among blacks, 57 percent were female compared to 53 percent of whites.

To learn whether the relative scarcity of older persons and males among blacks might help to explain their equality with whites in rates of alcohol disorders, the black rates were sex- and age-adjusted to the white rates. This increased the black rate from 13.3 percent to 14.5 percent, making it even closer to the white rate of 14.3 percent. It was concluded, therefore, that even if blacks had had the same life expectancy as whites, no higher rates of alcohol disorders would have been found in blacks than were found in whites. There remains the possibility, however, that alcoholism is more lethal in blacks than whites. If so, high rates would be expected in young blacks relative to whites, since they have not yet passed through the risk period for deaths. Similarly, a low rate in older blacks relative to whites would be expected because the former will have been more completely culled of alcoholics by premature alcohol-related deaths.

Table 4 shows lifetime and current (within the past year) disorder rates by age and sex. Being male is a very

Table 4.–Alcohol disorders by sex and age in blacks and whites, in percent

	Lifetime		Last year	
Sex/age	Black	White	Black	White
Men				
Age				
<45	21	32***	10	15*
45-59	36	22***	17	8*
60+	26	17***	6	4*
Total	24	27***	11	11*
Women				
Age				
<45	5	5***	2	2*
45-59	8	2***	2	1*
60+	3	1.5**	1	–*
Total	5	3***	2	1*

*$p < .05$.

**$p < .01$.

***$p < .001$.

important predictor of alcohol disorders in both races. In blacks, the male-to-female ratio is almost 5 to 1, and in whites it is 9 to 1. The higher ratio in whites results in the finding that black women have slightly but significantly higher rates than white women. When data on current disorders are examined, the male-to-female ratios are even higher–5.5 to 1 for blacks and 11 to 1 for whites.

When age is considered, however, a very different picture emerges for the two races. Among white men and women, lifetime rates of alcohol disorders are inversely related to age, declining from 32 percent in men under 45 to 17 percent in men age 60 or older and from 5 percent in women under 45 to 1.5 percent in women 60 or older. This distribution is consistent with the view that alcohol-related deaths have culled the older groups of alcoholics. In black men and women, however, rates are highest in the middle-aged group, those 45 to 59 years old. As a result, there are statistically significant differences between black and white men at each age level and between black and white middle-aged women. The overall similarity of rates in men occurs because the high rate in middle-aged and older black men relative to whites is balanced by low rates of alcohol problems in young black men. The significantly higher rate of alcohol disorders in black women comared with white women is accounted for by the high rate of alcohol disorders in the middle-aged group. This result is contrary to the hypothesis proposed. Perhaps the true rate is higher in whites, and whites are more prone to alcohol-related deaths, or perhaps blacks have a later age of onset and their younger members include many who will develop the disorder later.

Precursors of Alcohol Disorders

A number of predictors of alcohol disorders in the literature have been noted above. If as expected these predictors are potent in the current sample, an alternative to the two hypotheses above exists: levels of these precursors of alcohol disorders might for some reason be higher in young whites than in young blacks and yet higher in older blacks than older whites. Before pursuing the age distribution of these precursors, one must first be certain that they actually predict alcohol disorders in this sample.

Table 5 explores whether three supposed precursors (i.e., behavior problems in childhood, drunken-

Table 5.–Predictors of alcohol disorders in blacks and whites, in percent

	Black		White	
Precursor	Alcohol disorder present	Alcohol disorder absent	Alcohol disorder present	Alcohol disorder absent
Behavior problems	23	11**	44	9**
Drunk before 15	32	17**	49	16**
High school dropout	18	9**	15	14**

*$p < .01$.

**$p < .001$.

ness before age 15, and dropping out of high school) actually predict alcohol disorders for both blacks and whites. Behavior problems are counted as positive if two or more of nine behaviors occurred before the age of 15. The nine behaviors are fighting sufficient to lead to trouble at school or with neighbors, stealing, lying more than most youngsters, vandalism, repeated truancy over a 2-year period, disciplinary problems at school, being expelled or suspended from school, running away from home overnight, and being arrested.

All three precursors predicted alcohol disorders in blacks; behavior problems and early drunkenness predicted alcohol disorders in whites. It is noteworthy that alcohol disorder rates for blacks and whites are similar in the *absence* of behavior problems and early drunkenness, but in the presence of these precursors, whites have a higher liability to alcohol disorders than blacks do.

Table 6 examines the sex and age distribution of these precursors. Behavior problems and early drunkenness are more common in men than in women of both races, while high school dropout rates are similar in the two sexes. Behavior problems and early drunkenness are also more common in younger than in older

Table 6.–Precursors of alcohol disorders by age and sex, in percent

	Men		Women	
	Black	White	Black	White
Behavior problems				
Young	31	30	16	10
Middle-aged	16	16	5	4
Older	9	11	2	1
Drunk before 15				
Young	17	20	7	7
Middle-aged	13	10	5	3
Older	12	7	3	1
High school dropout				
Young	35	18	30	19
Middle-aged	65	35	58	36
Older	84	62	84	62

cohorts in both races, although the differences for drunkenness are small for black men. Dropping out of high school has the opposite pattern–it is more common in older cohorts than in younger cohorts. Dropping out of high school, in addition, is the only precursor for which rates differ substantially for blacks and whites; blacks have the higher rate in both sexes and in each age cohort. In sum, no evidence was found for a higher rate of precursors of alcohol disorders among young whites than among young blacks. Indeed, more young blacks than whites drop out of high school, which should increase their risk.

Another hypothesis tested here is that young whites are more sensitive to these precursors than young blacks, while older whites are less sensitive to these precursors than older blacks. To investigate differential sensitivity to these precursors by race and age, the precursors were entered into a logistic regression with alcohol disorder as the dependent variable, first for the total sample and then for men within each age group. The analyses by age were performed only for men, because sex was the most potent of all the predictors of alcohol disorders, as well as a key factor in behavior problems and early drunkenness. Ignoring sex would have confounded the analyses. Results for women are omitted because the frequency of these predictors in women was too low to allow testing.

In table 7, logistic regression shows that these predictors together explained 22 percent of the variance for blacks and 29 percent of the variance for whites. Dropout, which had not appeared to be a predictor for whites in table 5, actually was a modest predictor when the confounding effect of age was removed. For both blacks and whites, being male was the most important predictor of alcohol problems, and early drunkenness was the second most important predictor. Dropping out and behavior problems ranked differently for the two races, with dropping out more important for blacks and behavior problems more important for whites. Age, which had appeared to be so strikingly related to alcohol disorders for whites, was not a factor for either group when the other precursors were taken into account. Apparently, the age effect for whites was explained by the increased rates of behavior problems and early drunkenness in young cohorts.

When men were divided into age cohorts, it was found that these three precursors explained approximately equal amounts of variance for each age group, and they explained alcohol disorders in whites somewhat better than in blacks, as they had for the total sample. Explained variance declined to 10 percent for blacks (11 percent for older black men) and 14 percent for whites (15 percent for young white men) when sex was eliminated as a predictor.

Early drunkenness was the best predictor for both races in every age group. This finding demonstrates that early heavy use of substances is a specific predictor of substance abuse disorders, not merely an indicator of a general tendency toward deviance. In blacks, dropping out of school was a significant predictor only among the young, illustrating the change in meaning of failing to complete high school as the expected level of education has changed. Although there was a trend toward dropping out being associated with alcohol disorders in all age groups for whites as well as blacks, the differences were not statistically significant. Behavior problems, like dropping out, showed a trend toward predicting alcohol problems for older and younger blacks as well.

Nothing in the analyses suggested that the relationships between these variables and alcohol disorders differed markedly across age groups. Therefore, explanations for the low rate of alcohol disorders in young blacks compared with whites and the relatively high rate in middle-aged blacks must lie elsewhere, perhaps in some historical experience unique to middle-aged blacks. The middle-aged black group is the first black cohort to have a large proportion of its members reared in inner cities. They were confined to narrow areas and were almost universally poor. Perhaps this "second generation" experience for blacks reared in central cities by parents unfamiliar with city life, and so unable to counsel them, might have led to a high vulnerability to alcohol. Unfortunately, this hypothesis can be explored only in the St. Louis sample, since only in St. Louis were respondents asked where they lived at age 16.

Before exploring this hypothesis, it was necessary to verify that the age pattern of alcohol disorders noted for the sample as a whole also held for St. Louis. Accordingly, it was noted that white males exceeded blacks among the young in terms of number of alcohol disorders (27 percent of blacks versus 38 percent of whites). Black males exceeded whites among the middle aged (35 percent of blacks versus 18 percent of whites) and to a minor degree among the elderly (20 percent of blacks versus 15 percent of whites). The middle aged cohort had the highest rate for blacks, while the young had the highest rate for whites in St. Louis as elsewhere.

Table 7.—Logistic analysis of precursors of alcohol disorders in blacks and whites

Alcohol precursor	Total sample (Beta)		Male cohort (Beta)					
			Young		Middle-aged		Older	
	Black	White	Black	White	Black	White	Black	White
Male	1.4**	1.6**						
Drunk before 15	1.3**	1.5**	1.1**	1.3**	1.3**	1.7**	1.4**	1.5**
High school dropout	0.7**	0.3**	0.7**	0.3	0.6	0.3	0.1	0.4
Behavior problems	0.4*	1.1**	0.3	1.2**	1.2*	0.8*	0.6	1.1**
Age below 45	0.1	0.1						
R	.47	.54	.39	.38	.32	.38	.33	.38

*$p < .01$.

**$p < .001$.

Table 8.—Percentage in residence within SMSAs at age 16 and alcohol disorders in three black-white age cohorts

Current age	Residence in SMSA at age 16		Alcohol disorders by residence			
			Black		White	
	Black	White	SMSA	Other	SMSA	Other
<45	89	68	26	32	40	32
45-59	75	56	39	23	20	14
60+	35	63	35	12	14	18

To determine whether respondents had been reared in a Standard Metropolitan Statistical Area (SMSA) (i.e., a large city rather than a rural or small town area), each address given for the place of residence at age 16 was checked in the census closest to the year in which the respondent was 16 to learn whether that town was then part of an SMSA. As expected, we found that place of rearing for older blacks was predominantly rural (65 percent), while for young blacks it was predominantly urban (89 percent) (table 8). Among whites, there was no dramatic change, with about 60 percent being urban reared.

Blacks reared in rural areas showed the same pattern of alcohol disorders by age as did whites, i.e., the youngest group had the highest rate, and rates were low in the oldest group. Indeed, no significant differences were found between rural-reared blacks and urban- or rural-reared whites. Middle-aged and older urban-reared blacks, in contrast, had very high rates, as high as young urban-reared whites. Rates in young urban-reared blacks were slightly lower but not significantly different from those of young rural-reared blacks.

It is not clear why urban-reared young blacks no longer have the same high rate of alcohol disorders that the previous urban-reared generation had. Presumably, wider dispersion of the black population, the effects of more school and social integration, and perhaps having urban-reared parents who are no longer baffled by city ways have reduced the risks. If so, instead of equal black and white rates in the future, as still younger cohorts are added, blacks should be expected to show lower rates of alcohol disorder than whites. However, this prediction is offered with trepidation, since it is based on data from a single site in which the number of young and middle-aged nonurban-reared blacks was very small (N = 45).

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Alcohol Use and Related Problems Among Black and White Gynecologic Patients

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ABSTRACT

Drinking patterns, alcohol-related problems, and sociodemographic characteristics were examined in a systematic sample of 982 black and 985 white gynecologic outpatients. Data were gathered by using a self-administered questionnaire in three hospital clinics and two private practice settings. The prevalence of heavy drinking and alcohol-related problems was similar in blacks and whites, but there were significantly more abstainers and fewer light and moderate drinkers among the black outpatients. Young white women had high rates of heavy drinking that decreased with age, and young black women had low rates that increased up through the forties, after which they fell to about the same rates as for whites. Black housewives had high rates of heavy drinking compared with low rates for white housewives. Except among housewives, blacks tended to have rates of heavy drinking that were about the same as or lower than those among whites having similar sociodemographic characteristics. High rates of heavy drinking among black gynecologic patients are partially attributable to the fact that more of the blacks had never married, were unemployed, and had not completed any years of education beyond high school—all factors associated with higher rates of heavy drinking and alcohol-related problems.

Introduction

Recent reviews of the scientific literature have emphasized that there is little if any information available on the relationship of sociodemographic characteristics to drinking patterns and alcohol-related problems among black women in the United States (Dawkins 1980; Herd 1985; King 1982). In most studies of the general population, black representation is too small to permit detailed analyses of these relationships (Cahalan et al. 1969; Clark and Midanik 1982; Johnson et al. 1977). In addition, research that has focused on blacks has tended to concentrate on those who are socially and economically depressed, and results cannot be generalized to the entire black community (Bourne 1973; Robins et al. 1968; Sterne and Pittman 1972). These factors, together with a general tendency in the alcohol literature to study males, all help to account for the fact that so little is known about alcohol use and related problems among black women (Dawkins and Harper 1983; Leland 1984).

This paper examines the effects of age, education, marital status, employment, and number of living children on drinking patterns and indications of alcohol-related problems in black and white gynecologic outpatients. The analysis was motivated by the lack of research in this area and by the availability of data from the Women's Health Survey, which provided relevant information (Russell 1982). Women who have gynecologic problems are overrepresented among alcoholic women in treatment (Wilsnack 1982), and women identified in the general population as heavier drinkers or as having alcohol-related problems are more likely than women without these characteristics to report gynecologic problems (S.C. Wilsnack et al. 1984). Therefore, one might expect to see heavier drinking and more alcohol problems in the present sample of gynecologic outpatients than in a general household population sample, but high levels of alcohol use would not necessarily change the relationship of sociodemographic characteristics to drinking patterns and alcohol-related problems. Moreover, not all of the outpatients would have had gynecologic problems. Some may have come for routine care that was not prompted by ill health, such as pap smears, advice regarding contraception, or pregnancy tests. Others may use their gynecologists as primary care physicians and consult them for general health care as well as for gynecologic problems.

The relationships between sociodemographic characteristics and alcohol use in black women are particularly important because of the great interest in how changing social roles may be influencing the drinking patterns and problems of women in general. Many of the hypotheses regarding alcohol use in women are based on the stress-reduction theory: drinking relieves stress, and alcohol use increases as stress increases (Pohorecky 1981). It is further hypothesized that changing women's roles produce stress. One of the most obvious ways in which roles have been changing is that women are working outside the home in increasing numbers. It has been suggested that as women take on the traditionally more masculine role of working outside the home they may experience stress related to sex-role conflict, which could motivate them to drink more. An alternative to the stress theory is that the work role provides more drinking opportunities, such as business lunches, conferences, and office parties. It could also be argued that women who work may be better able to afford alcohol.

Entry into the labor force does not take place in a vacuum. Change in one role inevitably influences other roles. Accordingly, Johnson et al. (1977) have suggested that there may be an interaction between employment status and marital status as they relate to drinking in women. Their analysis of data from a 1975 national survey found that married women who are employed are more likely to drink heavily than either single working women or housewives. This study also found that women who are divorced or unemployed, regardless of any other status, have the highest rates of heavier drinking and problem drinking. However, this finding has not been replicated in subsequent studies (Parker et al. 1980; R.W. Wilsnack et al. 1984).

One interpretation of the finding that married women who are employed drink heavily is that maintaining multiple roles (e.g., working woman, wife, and, perhaps, mother) may be stressful. However, recent findings indicate that, in general, the more roles a woman has, the better her mental health (Kandel et al. 1985; Thoits 1983). This may come about because women with better mental health are more able to sustain multiple roles, or it may indicate that dissatisfaction with one role can be compensated for by achievements in another. However, certain role configurations are associated with greater stress and anxiety than others. Pearlin (1983) has characterized this as "role captivity." For example, an educated woman who would like to have a career may feel trapped because she has to stay in the home and care for her dependent children. A less-educated woman who may only qualify for a low-paying, dead-end job may feel equally trapped because she must leave her dependent children, perhaps in unsatisfactory child-care situations, in order to earn a living. In a further refinement of these studies, Wilsnack and Cheloba (1985) recently presented a paper on women's roles and problem drinking across the lifespan in which they demonstrated that the demands of multiple roles are not a major cause of women's problem drinking at any age. Rather, for women under age 65, the risk of problem drinking increased with age-specific role deprivation.

One might expect race to contribute significantly to some of these interactions. Black women enter the labor force earlier than white women, and working outside the home may represent less sex-role conflict. Therefore, full-time employment may be less stressful for black women than for white women. On the other hand, black women are more likely than whites to be employed in low-paying, monotonous jobs. Veroff et al. (1981) reported that blacks tend to find marriage more restrictive than whites do, and marriage may be less protective against stress and heavier alcohol use for black women. These are some of the hypotheses that guided our analyses.

Methods

Sample

In 1978 and 1979, gynecologic outpatients were systematically sampled at five sites in Buffalo, New York. These sites were selected to include patients from a broad range of socioeconomic levels. Four of the five sites were located in the city, and one was in the suburbs; two were private practices, and three were hospital-based clinics. In each site, an informed consent was obtained from eligible patients by a member of the research staff, who then gave each patient a self-administered questionnaire to be filled out while waiting to see the doctor. The questionnaire covered the quantity and frequency of alcohol and drug use, indications of problem drinking, and information on smoking, reproductive history, menstrual problems, and sociodemographic charcteristics. Questionnaires were completed by 2,080 patients. Refusal rates were 1 percent and 6 percent in the two private practices and ranged from 8 to 13 percent in the three clinic sites, for a combined refusal rate of 9 percent.

Alcohol Measures

Women who drank in the past year were asked how often they drank wine, beer, and liquor and how many drinks of each beverage they usually had on a day when they drank that beverage. These quantity-frequency data were used to calculate two measures of alcohol consumption. One was based on absolute alcohol per day, calculated by assuming that a standard drink of wine contained 4 ounces of 15 percent ethanol, a beer contained 12 ounces of 4 percent ethanol, and a drink of liquor contained 1 ounce of 45 percent ethanol (Clark and Midanik 1982; Johnson et al. 1977; S.C. Wilsnack et al. 1984). Under this system, women consuming 1 ounce or more of absolute alcohol (approximately two or more drinks) per day were considered heavier drinkers. Those consuming 0.22 to 0.99 ounces of absolute alcohol per day were classified as moderate drinkers, and those consuming less than 0.22 ounces a day were lighter drinkers. Abstainers never drank at all or drank less than once a year. Unfortunately, this measure has the limitation of being rather insensitive to binge drinking. Therefore, another measure was defined, as shown in the chart.

Drinking category	Quantity and frequency[a]
Abstainer	Not applicable
Not heavy	
Infrequent, light	Less than 5 drinks less than once per month, or 1 or 2 drinks less than 5 days per month
Moderate	1 or 2 drinks 5 or more days per month, or 3 or 4 drinks less than 15 days per month, or 5 or more drinks less than once per month
Heavy	
Moderately heavy	3 or 4 drinks 15 or more days per month
Infrequent heavy	5 or more drinks less than 10 days per month
Frequent heavy	5 or more drinks 10 or more days per month

[a] Quantity is the highest usual number of drinks (wine, beer, or liquor) per occasion. Frequency is the number of drinking days per month.

This approach has the potential to overstate drinking, since the quantity measure is based on the beverage for which the highest usual amount is consumed, and the frequency is based on drinking days for all three beverages, assuming no overlapping. By the same token, the data may underestimate heavy drinking inasmuch as questions were not asked on how often women had more or less than their usual amount of alcohol. Nancy Day (personal communication, 1985) asked these questions in a population of obstetric patients who were reporting their drinking patterns prior to pregnancy. The sample included women who reported drinking three or more times a week and controls who were not selected on the basis of their drinking patterns; therefore, the sample contained more heavy drinkers than one would ordinarily find in an unselected group of obstetric patients. Day found that, based on usual alcohol intake, 22.2 percent of the women in the sample were classified as heavier drinkers according to the quantity-frequency criteria used in the present study but when data on the times they drank more than their usual amount were taken into consideration, 36.2 percent qualified as heavier drinkers. There was no obvious tendency for the difference to vary either with age or race.

Indications of Problem Drinking

Questions were asked about behaviors that a number of investigators have found to be significant indicators of problem drinking (Mayfield et al. 1974; Seltzer 1971). These include doing things while drinking that could not be remembered (blackouts), having someone close to them worry about their drinking during the past year, inability to stop drinking when they want to, having drinking sometimes lead to family problems, drinking in the morning on occasion, sometimes feeling the need to cut down, having sought help for their drinking, and having been told by a doctor to stop drinking.

Sociodemographic Characteristics

Race was recorded at the time the subjects were recruited. The self-administered questionnaire requested year of birth, current marital status, years of school completed, current employment situation, and the number of pregnancies that resulted in the birth of children alive now.

Missing Data

Overall, data on one or more sociodemographic factors were missing for 74 patients, and data on alcohol consumption were missing for 124 patients. There were no significant racial differences in the distribution of missing demographic data, but blacks were twice as likely as whites to have missing alcohol data (8 percent to 4 percent). In approximately one-fourth of the cases with missing alcohol data, there was no information at all on the quantity or frequency of any of the alcoholic beverages consumed. For the remaining cases, some type of information was provided on the drinking patterns; however, these cases were classified as missing due to inconsistencies in the drinking data, which made it unclear whether the respondents were current or former drinkers. The drinking data that were provided for these cases suggested that most were very infrequent, light drinkers; only five were classified as heavy drinkers based on their absolute alcohol consumption per day. Therefore, it is not likely that the greater proportion of missing drinking data for blacks contributed to an underestimate of either heavier drinking or abstinence in this population.

Data Analysis

In order to evaluate the degree to which the sociodemographic characteristics of the gynecologic outpatients resembled those of the general household population, the distributions of age, education, employment, and marital status among black and white survey respondents were compared with data from the 1980 census for the Buffalo Standard Metropolitan Statistical Area (U.S. Department of Commerce 1983). The detailed results of this analysis are available from the author. There are approximately twice as many black gynecologic patients between the ages of 15 and 19 as whites and somewhat more whites than blacks in the older age categories. The largest proportion of the gynecologic patients were in their twenties, and fewer were over 50. Since education, employment, and marital status are highly correlated with age, the age of the gynecologic patients was adjusted in further comparisons with the census data. Among females 25 or over, there were no major differences in education between the black and white gynecologic outpatients, but the black patient population tended to be better educated than the general black female population. Blacks over 16 years old, both in the patient population and in the census, were more likely than whites to be unemployed and looking for work (28 percent compared with 9 percent). Unemployment was also more prevalent among white gynecologic outpatients than in the census population (9 percent compared with 3 percent). Black outpatients were less likely than white outpatients to be married (19 percent compared with 37 percent) and more likely to report that they had never married. Both black and white gynecologic outpatients were less likely to be married than women in the census, mainly because of an excess in the number who were divorced, separated, or widowed; the proportion never married was about the same in the census and patient populations for both races (25 percent for whites and 38 to 40 percent for blacks).

The plan for data analysis was to compare drinking patterns and the prevalence of indications of problem drinking and to examine the relationship between age and drinking patterns in black and white gynecologic outpatients. Analysis of variance was used to investigate the influence of interactions between race and age, education, employment, marital status, and number of living children on drinking patterns and indications of problem drinking (Norusis 1985). Following a hierarchical design for the analysis of variance, main effects were entered first, followed by their interactions with race. Two-way and three-way interactions of sociodemographic characteristics suggested by the literature and their interactions with race were also included in the analysis. Initially, both weighted and unweighted data were examined for significant interactions: The weighted means take into consideration the number of individuals in each cell of the analysis; the unweighted means treat each cell as though the N's

Table 1.–Drinking patterns by race, in percent

Drinking pattern	Black		White		Total	
Classification based on ounces of absolute alcohol per day[a]						
Abstainers		27.2		14.2		20.6
Lifetime		14.9		6.7		10.7
Former drinker		7.7		5.1		6.4
Drink less than once a year		4.6		2.4		3.4
Lighter drinkers		38.7		43.8		41.3
Moderate drinkers		22.8		30.1		26.5
Heavier drinkers		11.3		11.9		11.6
Classification based on quantity-frequency[b]						
Abstainers		24.0		12.1		18.0
Infrequent, light		32.3		31.4		31.9
Moderate		26.8		37.1		32.0
Moderately heavy, frequent	16.9	4.6	19.4	3.3	18.2	4.0
Heavy, infrequent		7.9		10.3		9.1
Heavy, frequent		4.4		5.8		5.1
N	(904)		(939)		(1,843)	

[a] $\chi^2=50.5$; df=3; $p<.001$.

[b] $\chi^2=58.2$; df=5; $p<.001$.

were equal, which has the effect of "holding constant" the influence of factors that were entered into the model prior to the effect being tested (Norusis 1985). Since preliminary analyses showed little difference between the weighted and unweighted data, tables 6-10 present the unweighted means, expressed as a function of the sociodemographic characteristics with which they were significantly associated.

Among the dependent alcohol measures examined by using the analysis of variance model was whether or not a person drinks. Abstainer versus drinker is a dichotomous measure. As such, it does not meet the assumptions of regression analysis: an unrestricted range for the dependent variable and homoscedasticity of the error term. Another statistical method, such as log-linear regression, is usually used in such cases. However, analysis of variance is a special case of regression analysis (Cohen and Cohen 1975). It has been argued that when the split on the dichotomous dependent variable for the sample as a whole is between 25 percent and 75 percent, treating the dependent variable as a dummy variable and using standard multiple regression techniques to analyze the data yield results similar to those obtained with the log-linear regression (Knoke 1975; Goodman 1976, cited by Gillespie 1977). The split on abstention is 21 percent-79 percent, and since it does not meet the suggested 25 percent-75 percent criteria, the significance of the associations in the model should be regarded with caution. Although the detailed interactions in the model do not lend themselves readily to alternative methods of analysis, the data are included for the readers' interest. Weighted and unweighted means from the analysis of variance are of particular interest because, in the case of a dichotomous dependent variable, they represent percentages, in this case the percentage of drinkers. A similar issue arises in the case of heavier drinking, where heavier drinking is

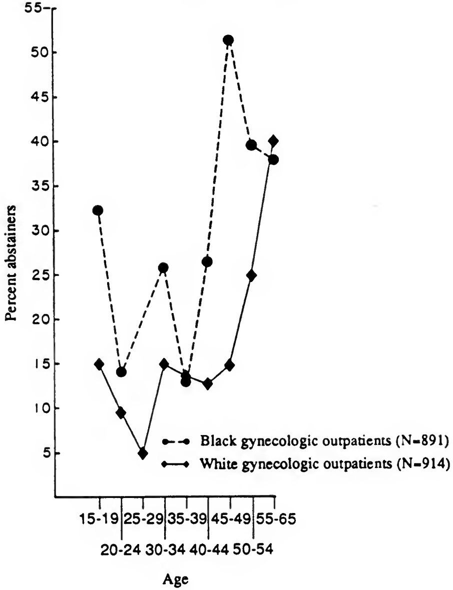
Table 2.—Current indications of problem drinking by race

Indications of problem drinking (IPD)	Black		White		Total		
	Sample size	Percent IPD	Sample size	Percent IPD	Sample size	Percent IPD	Probability[a] for χ^2
1. Blackouts	874	12.1	918	16.0	1,792	14.1	.02
2. Relatives worried in past year	907	6.0	935	5.1	1,842	5.5	n.s.
3. Not able to stop	897	4.5	932	3.9	1,829	4.2	n.s.
4. Drinking leads to problems	903	4.2	934	4.2	1,837	4.2	n.s.
5. Drink in morning	903	3.7	934	1.8	1,837	2.7	.02
6. Feel need to cut down	897	11.6	931	11.2	1,828	11.4	n.s.
7. Ever gone for help	899	1.0	934	1.5	1,833	1.3	n.s.
8. Told by doctor to stop	901	4.7	933	3.4	1,834	4.0	n.s.
9. Father had drinking problems	921	25.6	957	26.6	1,878	26.1	n.s.
10. Mother had drinking problems	947	9.7	960	9.0	1,907	9.3	n.s.
One problem	909	14.4	939	16.8	1,848	15.6	n.s.
Two or more problems	909	10.7	939	10.1	1,848	10.4	n.s.

[a] χ^2 based on cross-tabulations for race by number of respondents with and without indications of current problem drinking.

n.s. = not significant.

Figure 1. Abstention by age and race



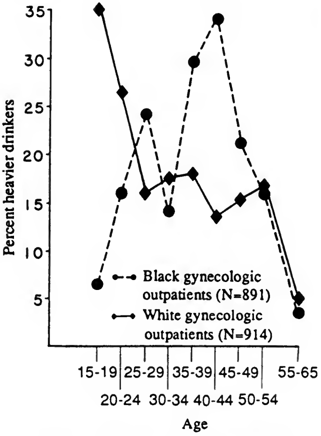
contrasted with drinking that is not heavy. The split on heavier drinking based on quantity and frequency was 18 percent-82 percent, and that on heavier drinking based on the consumption of absolute alcohol per day was 12 percent-88 percent. Analysis of abstinence was done on the entire sample, and analyses of alcohol consumption, heavier drinking, and indications of problem drinking were done on drinkers only.

Results

Drinking patterns and indications of problem drinking are analyzed by race in tables 1 and 2. As indicated in previous surveys (Caetano 1984; Cahalan et al. 1969; Clark and Midanik 1982; Johnson et al. 1977; Russell and Welte 1980), blacks are more likely to abstain, but if they do drink, they are more likely to drink heavily and to have alcohol-related problems. This results in overall prevalence rates of heavier drinking and indications of problem drinking that are quite similar in black and white women.

Age has a major influence on drinking patterns. Blacks are more likely than whites to abstain at every age except 35-39 years (figure 1). In both races, abstinence decreases with age and then increases;

Figure 2. Heavier drinking by age and race



Note: Heavier drinking is defined as having a usual intake of five or more drinks per occasion and drinking at least once a month, or having a usual intake of three of four drinks per occasion and drinking on 15 or more days per month.

however, among blacks the increase starts at an earlier age. Heavier drinking was found to be five times more prevalent among young white than among young black gynecologic outpatients (35 percent compared with 7 percent) (figure 2). Among whites, heavier drinking decreases with age through the early twenties, leveling off at about 16 percent up until 50 years, after which it again decreases. In direct contrast, heavy drinking among blacks increases with age through the twenties, falls somewhat in the early thirties, and then *increases* again to peak in the early forties. By age of 50, the prevalence of heavy drinking is falling at rates that are quite similar in the two groups.

In table 3, data are age-adjusted for comparison with the 1981 national survey of women's drinking conducted by S.C. Wilsnack et al. (1984). Among the younger women who make up the bulk of the gynecologic outpatient population, there are clearly fewer abstainers and more heavier drinkers than in the national survey, both among blacks and whites. There continues to be an excess of heavier drinkers among both black and white gynecologic patients at ages 35 to 49, but by age 50 to 64 the excess of heavier drinkers is limited to the white gynecologic patients. Among women over age 65, there are fewer heavier drinkers than in the national survey, but this may be partly a function of the relatively few gynecologic patients in this older age category.

Among married women in the 1981 national survey, rates of heavier drinking do not vary much with employment status (table 4). Among married gynecologic patients, rates of heavier drinking are high for both blacks and whites who are employed part-time, but there are striking differences between blacks and whites who work full-time and those who are housewives. Heavier drinking is low among blacks who work full-time and high among whites. Among housewives, however, the opposite relationship is seen, with whites having low rates and blacks having high rates of heavier drinking. The 1981 national survey comprised too few women who were not married to allow analyzing other marital status by employment; therefore, data for never-married, divorced or separated, and widowed women include all employment situations except being unemployed and looking for work. Never-married and widowed black patients and white gynecologic patients tend to drink more heavily than women in the national survey; however, black patients who were divorced or separated drank less heavily and white patients drank more heavily than in the national sample. The highest rates of heavier drinking were seen among gynecologic patients who were unemployed and looking for work (19 percent black and 23 percent white, respectively). These rates were around four times the national rate for this employment situation.

The statistical significance of the main effects of the sociodemographic variables and the interactions of the sociodemographic variables with race are summarized in table 5. Of the higher-order interactions examined, age by education by race was related to heavier drinking based on quantity and frequency ($p < .01$) and to abstinence ($p < .01$), marital status by employment by race was associated with abstinence ($p < .05$) and drinking days per month ($p < .05$), marital status by employment by number of living children was associated with indications of problem drinking ($p <$

Table 3.–Percentages[a] of black and white gynecologic outpatients at different drinking levels by age group, compared to National Household Survey respondents

Age group	1981 National Household Survey respondents	1978-1979 white gynecologic outpatients[b]	1978-1979 black gynecologic outpatients[b]
21-34			
Abstainers	30	11	20
Lighter drinkers	41	45	42
Moderate drinkers	24	33	24
Heavier drinkers	6	12	14
Unweighted N	(356)	(506)	(466)
Weighted N	(847)	(263)	(243)
35-49			
Abstainers	28	16	28
Lighter drinkers	43	49	29
Moderate drinkers	20	24	29
Heavier drinkers	9	12	14
Unweighted N	(243)	(144)	(140)
Weighted N	(670)	(204)	(198)
50-64			
Abstainers	48	21	42
Lighter drinkers	37	47	37
Moderate drinkers	10	23	16
Heavier drinkers	4	9	5
Unweighted N	(190)	(114)	(67)
Weighted N	(588)	(228)	(134)
65+			
Abstainers	67	41	71
Lighter drinkers	25	47	21
Moderate drinkers	7	13	7
Heavier drinkers	2	0	0
Unweighted N	(111)	(32)	(28)
Weighted N	(388)	(125)	(109)
Totals			
Abstainers	39	19	35
Lighter drinkers	38	47	34
Moderate drinkers	17	25	21
Heavier drinkers	6	9	10
Unweighted N	(901)	(827)	(757)
Weighted N	(2,497)	(820)	(684)

Note: 1981 National Survey data based on R.W. Wilsnack et al. (1984).

[a] Percentages are based on weighting and may not add to 100 due to rounding.

[b] Weighted to compensate for differences in age distribution between the National Household Survey and the Women's Health Survey.

Table 4.—Percentages[a] of black and white gynecologic outpatients at different drinking levels by marital status and employment status, compared to 1981 National Household Survey respondents

Status	1981 National Household Survey respondents	White gynecologic outpatients[b]	Black gynecologic outpatients[b]
Married, employed full-time			
Abstainers	41	4	15
Lighter drinkers	40	45	63
Moderate drinkers	14	43	22
Heavier drinkers	4	9	1
Unweighted N	(189)	(93)	(47)
Weighted N	(565)	(83)	(38)
Married, employed part-time			
Abstainers	34	2	24
Lighter drinkers	37	66	43
Moderate drinkers	24	20	21
Heavier drinkers	4	11	13
Unweighted N	(97)	(63)	(16)
Weighted N	(282)	(61)	(15)
Married housewife			
Abstainers	43	12	60
Lighter drinkers	42	63	13
Moderate drinkers	9	21	13
Heavier drinkers	6	4	14
Unweighted N	(177)	(120)	(44)
Weighted N	(619)	(131)	(56)
Never married[c]			
Abstainers	28	20	20
Lighter drinkers	35	35	37
Moderate drinkers	28	33	28
Heavier drinkers	9	12	15
Unweighted N	(106)	(206)	(176)
Weighted N	(228)	(143)	(122)

Note: 1981 National Household Survey data based on R.W. Wilsnack et al. (1984).

[a] Percentages are based on weighting and may not add to 100 due to rounding.

[b] Weighted to compensate for differences in age distribution between the National Household Survey and the Women's Health Survey.

[c] Includes women who were employed full-time or part-time, housewives, retired, and other, but not those who were unemployed and looking for work.

Table 4.—Percentages[a] of black and white gynecologic outpatients at different drinking levels by marital status and employment status, compared to 1981 National Household Survey respondents—Continued

Status	1981 National Household Survey respondents	White gynecologic outpatients[b]	Black gynecologic outpatients[b]
Divorced or separated[c]			
Abstainers	28	24	40
Lighter drinkers	37	41	32
Moderate drinkers	28	23	22
Heavier drinkers	8	12	6
Unweighted N	(109)	(145)	(127)
Weighted N	(249)	(158)	(155)
Widowed[c]			
Abstainers	62	33	47
Lighter drinkers	28	47	35
Moderate drinkers	8	17	14
Heavier drinkers	1	3	4
Unweighted N	(74)	(44)	(52)
Weighted N	(244)	(118)	(131)
Unemployed and looking for work			
Abstainers	22	16	21
Lighter drinkers	51	39	35
Moderate drinkers	22	22	26
Heavier drinkers	5	23	19
Unweighted N	(48)	(70)	(221)
Weighted N	(98)	(50)	(140)

[a] Percentages are based on weighting and may not add to 100 due to rounding.

[b] Weighted to compensate for differences in age distribution between the National Household Survey and the Women's Health Survey.

[c] Includes women who were employed full-time or part-time, housewives, retired, and other, but not those who were unemployed and looking for work.

.01), and marital status by employment by education was related to absolute alcohol per day ($p < .05$) and drinking days per month ($p < .05$).

As is often the case with sociodemographic factors and alcohol use, the analyses of variance do not account for a large proportion of the variability in the drinking measures. As measured by Eta, the variability accounted for by the analyses ranged from 4 percent in the case of the percentage of drinkers to a high of 11 percent and 12 percent in the case of heavier drinking based on absolute alcohol per day and quantity and frequency, respectively. For the continuous drinking measures, Eta was 6 percent for the highest usual number of drinks per occasion, 8 percent for drinking days per month, and 9 percent for absolute alcohol per day in ounces. Even the analysis of indications of problem drinking, with three drinking measures in addition to the sociodemographic variables and their interactions in the model, only accounted for 25 percent of the variability in the problems studied.

Table 5.—Statistical significance of relationship between sociodemographic factors and drinking patterns and indications of problem drinking: Hierarchical analysis of variance model, current drinkers only ($N = 1,474$)

Sociodemographic factors	Degrees of freedom[a]	Probabilities						
		Abstainers versus drinkers[b]	Absolute alcohol per day (ounces)	Highest usual drinks per occasion	Drinking days per month	Heavier drinking (absolute alcohol ≥1 ounce)	Heavier drinking (based on QF)	Indications of problem drinking[c]
Age	5	<.001	n.s.	.001	n.s.	.030	.002	n.s.
Education	2	<.001	.001	<.001	n.s.	.010	<.001	.001
Employment status	3	<.001	n.s.	.017	<.001	.031	n.s.	.025
Marital status	3	n.s.	.005	.001	.006	.011	.002	n.s.
Number of living children	1	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Race	1	<.001	n.s.	<.001	n.s.	n.s.	.012	n.s.
Race by age	5	n.s.	n.s.	.001	.002	<.001	<.001	n.s.
Race by education	2	n.s.	n.s.	n.s.	<.001	n.s.	n.s.	n.s.
Race by employment status	3	.002	.043	n.s.	.017	.040	.011	n.s.
Race by marital status	3	.027	n.s.	.043	n.s.	n.s.	n.s.	n.s.
Race by number of living children	1	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

[a] Degrees of freedom for the error term for the hierarchical model are 1,341 for the drinking measures and 1,338 for the indications of problem drinking.

[b] Analysis on abstention included abstainers and drinkers ($N = 1,779$).

[c] Drinking variables, absolute alcohol per day, highest usual drinks per occasion, and drinking days per month were entered into the model before the sociodemographic variables.

n.s. = not significant.

Another way of evaluating the significance of an analysis of variance is to examine the variation in mean values for the dependent variable with respect to the independent variables. Means for the drinking measures and indications of problem drinking, according to race and other sociodemographic factors, are presented in detail in tables 6 through 10. Since prelminary analyses showed little difference between the weighted and unweighted data, these tables present only unweighted means.

For age (table 6), the analysis of variance established the significance of the main effects of age and race on the percentage of drinkers in the population and found no significant interaction between age and race. Given that the respondents drank, there were significant interactions between age and race for three of the drinking measures: the highest usual number of drinks per occasion, drinking days per month, and heavier drinkers based on quantity and frequency. These measures varied according to the patterns previously described, low values among younger and older blacks with a peak in the forties, and a decrease from high to low among whites with increasing age (except for drinking days per month, which did not decrease consistently with age among whites).

The proportion of drinkers increased with education (table 7), but the mean absolute alcohol per day, the mean highest usual number of drinks per occasion, and the percentage of heavier drinkers based on quantity and frequency all decreased with increasing education in both blacks and whites. The only drinking variable to increase with education was mean drinking days per month; however, this increase was seen in whites and not in blacks. Mean indications of problem drinking decreased among both blacks and whites with higher education, even after decreases in alcohol consumption were taken into consideration.

Mean indications of problem drinking were lowest among working women, somewhat higher in housewives and women looking for work, and highest in the retired/other category, which included students and women who were retired, disabled, etc. (table 8). Interactions between race and employment were significantly associated with several of the drinking measures. Among both blacks and whites, working women were most likely to drink, followed closely by women who were looking for work. Retired and other women were least likely to drink, and black housewives were more like this group than white housewives, who were more like women who were working or looking for work. Mean absolute alcohol per day was low in working women of both races, in black retired and others, and in white housewives, but it was high in women of both races looking for work, in black housewives, and in white retired and others. Mean drinking days did not vary as markedly between the races. However, the percentage of heavier drinkers based on quantity and frequency was highest in black housewives and lowest in white housewives. In other employment categories, the percentage of heavier drinking was about the same in both races.

Again, starting with main effects, mean absolute alcohol per day, mean drinking days per month, and percentage of heavier drinkers based on quantity and frequency, all were highest among never-married women and lowest among married women (table 9). Divorced or separated women also tend to be high on the drinking measures, and widows are intermediate, except in the case of drinking days per month, where widows are somewhat higher than divorced or separated women. Race and marital status interact significantly in their relationships with abstinence and the highest usual number of drinks per occasion. Among blacks, married women were most likely to abstain; among whites, they were least likely at abstain. Means for the highest usual number of drinks per occasion were lowest among blacks for married, divorced, or separated women and highest for never-married women and widows; among whites, means were lowest for married women and widows and highest for those who were never married or who were divorced or separated.

Weighted and unweighted means of absolute alcohol intakes per day for blacks and whites are presented in table 10. The actual mean absolute alcohol per day is marginally higher among blacks in the sample, even when abstainers are included in the analysis (0.64 compared with 0.62 in whites). Without abstainers, the difference is greater, 0.83 compared with 0.70. When sociodemographic characteristics are held constant and abstainers are included in the analysis, blacks consume *less* absolute alcohol per day on the average (0.59 ounces compared with 0.61 ounces), but when only drinkers are considered, blacks are seen to drink somewhat more than whites (0.79 ounces compared with 0.70 ounces).

Discussion

One of the most significant findings of this analysis is the interaction between age and race. Racial differences in rates of heavier drinking similar to

Table 6.—Drinking patterns by age and race for current drinkers (N=1,474)

	Drinkers[a]		Highest usual drinks per occasion				Mean drinking days per month		Percent heavier drinkers based on quantity and frequency	
			Black		White					
Age	Percent	N	Mean	N	Mean	N	Black	White	Black	White
0-19	69	210	2.6	96	3.5	62	3.5	8.8	3	27
20-29	86	846	2.9	366	3.5	388	9.0	7.0	18	23
30-39	83	319	3.1	107	3.3	165	8.6	9.2	21	21
40-49	73	166	4.7	58	3.1	71	11.4	6.3	49	18
50-59	69	140	2.6	33	3.0	68	5.9	7.6	15	16
60+	58	98	2.9	18	2.0	42	5.0	8.2	11	3

Note: Percentages, means, and sample Ns are unweighted.

[a] Sample N includes drinkers and abstainers (N=1,779).

Table 7.—Drinking patterns and indications of problem drinking by education and race for current drinkers (N = 1,474)

Education	Drinkers[a]		Absolute alcohol drinking day (ounces)		Drinking days per month				Mean highest usual number of drinks per occasion	Percent heavier drinkers based on quantity and frequency	Mean indicators of problem drinking[b]
					Black		White				
	Percent	N	Mean	N	Mean	N	Mean	N			
Some high school	65	629	.85	460	8.2	268	6.5	192	3.5	25	.72
High school graduate	75	562	.63	467	8.7	221	8.1	246	2.8	19	.58
Some college or more	91	588	.53	547	6.5	189	9.1	358	2.6	12	.47

Note: Percentages, means, and sample Ns are unweighted.

[a] Sample N includes drinkers and abstainers (N = 1,779).

[b] Based on eight behavioral indicators of problem drinking, controlling for absolute alcohol per day, highest usual number of drinks per occasion, and drinking days per month.

Table 8.—Drinking patterns and indicators of problem drinking by employment status and race for current drinkers (N = 1,474)

Employment status	Drinkers[a]				Absolute alcohol per day (ounces)				Mean drinking days per month		Percent heavier drinkers based on quantity and frequency		Indicators of problem drinking[b]	
	Black		White		Black		White							
	Percent	N	Percent	N	Mean	N	Mean	N	Black	White	Black	White	Mean	N
Working	79	270	90	411	.62	228	.55	395	7.4	9.0	17	15	.50	623
Looking for work	74	330	89	101	1.33	268	1.07	89	10.8	9.8	26	28	.59	357
Housewife	62	126	84	216	.94	81	.51	185	7.7	6.3	27	13	.59	266
Retired/other	58	151	61	174	.40	101	.81	127	6.6	6.5	21	21	.74	228

Note: Percentages, means, and sample Ns are unweighted.

[a] Sample N includes drinkers and abstainers (N = 1,779).

[b] Based on eight behavioral indicators of problem drinking, controlling for absolute alcohol per day, highest usual number of drinks per occasion, and drinking days per month.

Table 9.—Drinking patterns by marital status and race for current drinkers (N = 1,474)

Marital status	Drinkers[a]				Highest usual drinks per occasion				Absolute alcohol per day		Mean drinking days per month	Percent heavier drinkers based on quantity and frequency
	Black		White		Black		White					
	Percent	N	Percent	N	Mean ounces	N	Mean ounces	N	Mean ounces	N		
Never married	75	472	76	318	3.6	384	3.4	286	1.08	670	9.5	24
Married	56	151	86	362	3.0	105	2.7	326	.44	431	7.3	12
Divorced/married	68	195	79	178	2.9	150	3.6	150	.70	300	7.4	22
Widowed	75	59	74	44	3.7	39	2.5	34	.57	73	8.6	17

Note: Percentages, means, and sample Ns are unweighted.

[a] Sample N includes drinkers and abstainers (N = 1,779).

Table 10.–Mean absolute alcohol per day by race, including and excluding abstainers

	Black		White	
	Mean ounces	N	Mean ounces	N
Abstainers and drinkers	0.59	877	0.61	902
Drinkers only	.79	678	.70	796

Note: Means and sample NS are unweighted.

those seen in young gynecologic outpatients have also been reported in high school students (Barnes and Welte 1986; Rachal et al. 1980). It has been suggested that the lower prevalence of heavier drinking among black high school students may be related to higher dropout rates, although dropout rates are similar for blacks and whites up to age 18 (Lowman et al. 1983). Replicating this finding in a nonschool population lends support to the interpretation that heavier drinking is, in fact, less common among black teenage females than among white teenage females, rather than an artifact.

The difference between blacks and whites in the way in which rates of heavier drinking change with age has been reported previously by Caetano (1984). He found that in northern California, heavier drinking increased among black males from the twenties to the thirties, but decreased among white males. The decrease in heavier drinking with age in national surveys, in which white respondents predominate, has been interpreted to represent a maturing out effect as individuals take on more stable roles of marriage and full-time employment (Edwards 1984). The fact that heavy drinking among blacks tends to increase rather than decrease during the twenties may indicate greater difficulty in establishing stable marital and employment roles.

Among drinkers, both employment and marital status significantly interacted with race in their relationship to alcohol consumption, even after main effects had been taken into account. This interaction indicates that differences in alcohol consumption between blacks and whites related to employment and marital status cannot be attributed to differences in age and education. Thus, blacks seem to find marriage and full-time employment the least stressful condition, as measured by low rates of heavier drinking, whereas whites are least likely to drink heavily if they are married and housewives. This finding is consistent with observations that blacks view marriage as more restricting than whites, since being married and a housewife does not protect black women from relatively high rates of heavier drinking. It may also reflect a greater importance among blacks of the economic security represented when a wife has a full-time job.

Women who are unemployed and looking for work or who are divorced or separated are overrepresented among gynecologic patients, particularly among blacks. Thus, perhaps some of the excess gynecologic problems noted among alcoholics and heavier drinkers may be attributable to stress associated with unemployment and divorce or separation. Similarly, a portion of the excess of heavier drinking among blacks in this sample is attributable to the fact that more blacks are in the high-risk groups, such as those who are unemployed and looking for work. The identification of these factors is important in planning prevention and early intervention efforts for vulnerable segments of the population and in guiding further research on the role of sociodemographic characteristics in the development of heavier drinking patterns and of problem drinking among black and white women.

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Alcohol Behaviors Among Southern Blacks and Whites: A Comparative Analysis

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ABSTRACT

This paper presents preliminary findings from an epidemiologic study of alcohol use and problem drinking among differing social and demographic subgroups of the general population (N = 1,063). The data are controlled for age, sex, and race. Problem drinking is defined as congruent with symptoms of excess and dependence, social consequences, and physical health sequelae. Problem drinking is also viewed in the context of the DSM-III criteria for alcohol abuse and dependence as determined by the Diagnostic Interview Schedule (DIS). These preliminary findings are based on responses from 296 blacks and 767 whites, representing approximately one-half of the field survey data that have been collected. Overall, a higher proportion of abstainers was found among blacks than among whites. The highest prevalence rates of current alcohol use were found among white males ages 18 to 29 (94.3 percent), and the lowest rates were found among black females age 60 or older (15.7 percent). Blacks tended to begin drinking later than whites in most age cohorts. In addition, more males than females of both races were found to be consumers of alcohol. The lowest current prevalence rates of alcohol abuse and/or dependence as determined by the DIS were found among white males ages 18 to 29 and black males ages 30 to 59. However, the small cell sizes dictate caution in interpreting the latter finding. Of particular significance is the observation that alcohol abuse and/or dependence occurred at some time in the lives of approximately 25 percent of both white and black males; the rates for white and black females were much lower.

Introduction

This paper presents descriptive epidemiologic field survey findings on the prevalence of alcohol use and its consequences among black and white people residing in the southeastern United States. Drinking behaviors of southeastern blacks are compared to those of whites living in the same area based on data from two surveys: The first of these surveys, study 1, was conducted between 1970 and 1973. The second survey, study 2, was initiated in 1982, and data collection is scheduled to be completed in the fall of 1985.

In study 1, information was obtained on 4,202 persons 18 years of age and over. Of this number, 3,469 (82.6 percent) were white and 707 (16.8 percent) were black. These percentages closely approximate the population from which the samples were drawn. The study 2 sample comprised 2,100 respondents. However, the study 2 findings are limited to about half (N = 1,063) of the total sample because all of the data from this study are not yet available. Of this total, 767 (72.1 percent) were white and 296 (27.9 percent) were black. The increased proportion of blacks in study 2 resulted from the deliberate oversampling of this group because so little is known about the drinking histories and behaviors of blacks. Additional findings from study 2 will be forthcoming once the project is completed.

Alcohol Research and Blacks

Blacks are the oldest and largest minority group in the United States. According to the 1980 census, about 26 million blacks, constituting 11.7 percent of the U.S. population, were living in this country. Yet relatively little has been written about the epidemiology of alcohol use among blacks, in spite of their extended history and numbers. Furthermore, what has been published tends to center on blacks in treatment for alcohol-related problems and not on general population samples (Strayer 1961; Vitols 1968; Viamontes and Powell 1974; Kolb et al. 1976). Harper and Dawkins (1976), in an extensive literature review, found that approximately 16,000 articles on alcohol have been published in scientific journals over the past 30 years. Only 77, less than one-half of 1 percent, dealt in some manner with alcohol use among blacks; only 11 of the articles focused exclusively on blacks. In addition, no scientific articles were found which reported empirical data on alcohol use among blacks in the general population. The lack of scientifically defensible facts regarding alcohol use and its consequences for blacks has, understandably, led to the emergence of popular myths, controversy, stereotypes of drinking behaviors, and unfavorable comparisons vis-a-vis white standards (Bourne 1973; Benjamin and Benjamin 1981; Royce 1981).

At present, epidemiologic knowledge regarding alcohol use among blacks has come largely from two primary sources: studies of populations in treatment and mortality statistics related to cirrhosis of the liver. Clearly, clinical data are very useful in understanding the behaviors of those who seek treatment for problems and, additionally, provide useful information about the human services delivery system. However, only a small proportion of those people who have alcohol problems actually receive treatment. Many of those who do receive treatment cannot be identified for research purposes, inasmuch as their care takes place in private settings which are inaccessible to researchers. As a result, treatment data provide epidemiologists with limited information insofar as true prevalence and incidence rates are concerned.

A second major source of epidemiologic data on black drinking behaviors has come from cirrhosis mortality rates (Malin et al. 1982; Nace 1984; Herd 1985). The systematic use of mortality statistics to estimate the prevalence of alcohol abuse began with the pioneering efforts of Jellinek (World Health Organization 1951). Reliance on these rates, however, for the formulation of precise prevalence and incidence estimates has been questioned by many investigators. Cirrhosis mortality statistics are useful as general indicators of alcohol use and, when properly applied, can provide insight into the prevalence of alcohol abuse in the general population. However, due to their lack of specificity and sensitivity, these statistics are not valid or reliable measures of the true prevalence or incidence of alcohol abuse.

The methodological deficiencies inherent in treatment and mortality statistics threaten the accuracy and completeness of findings from these two sources. Accordingly, the field of alcohol epidemiology has begun to rely much more heavily than in the past on field surveys of the general population. Auth and Warheit (1982/1983) in their review of research on the topic identified 19 major field surveys conducted between 1946 and 1977. Since then, a number of other important studies have been completed, including one which focused on alcohol consumption and alcohol-related problems among females (R.W. Wilsnack et al. 1984; S.C. Wilsnack et al. 1984). Since none of these studies included large samples of blacks, epidemiologists have not been able to offer meaningful conclusions regarding the prevalence or incidence of alcohol use and abuse among this minority group.

The epidemiology of alcohol use among persons in the United States has been advanced significantly in recent years as the result of two major federally supported research programs: The Epidemiologic Catchment Area (ECA) projects developed and funded by the National Institute of Mental Health (NIMH) and the Alcohol Research Centers (ARC) programs conceived and funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA). The ECA projects included approximately 20,000 persons and a statistically representative sample of blacks (N = 2,761). The projects were primarily intended to collect information on the prevalence of psychiatric disorders in the general population, including measures of alcohol abuse and dependence, by means of the Diagnostic Interview Schedule (DIS) developed by Robins et al. (1981). The ECA studies are providing DSM-III diagnoses for alcohol abuse and dependence for large samples of blacks in different geographical areas of the United States.

The Alcohol Research Group at Berkeley, which is part of the ARC program, has been conducting a special study of drinking patterns among blacks in the United States. The results of this study will provide a national overview of black alcohol use, problems, and consequences.

A third source of data on drinking behaviors among blacks has been generated through alcohol research at the University of Florida. The NIAAA-funded Center for Alcohol Research at Florida was designed primarily to study the relationships between alcohol and aging. For this reason, the basic epidemiologic field survey focused much of its attention on the drinking patterns of those 60 years of age and over. However, in keeping with a long-term research interest in race and ethnicity, the study design called for an oversampling of blacks. Although the total number of blacks interviewed is relatively small (N = 500), it is large enough to make comparisons with the findings from our earlier alcohol research in the same communities. Moreover, the Florida data can be compared to that produced by the ECA projects and the Alcohol Research Group at Berkeley because the interview schedule included both the items necessary to make the DIS diagnoses of alcohol abuse and dependence as well as a great many of the problems and consequences questions developed by the Berkeley group.

The ECA and ARC programs will provide a wealth of information on the drinking behaviors and consequences of alcohol use among blacks. Since the Florida project was designed specifically to bring together the clinical approach of the DIS and the problems/ consequences approach of the Berkeley group, it serves to integrate the findings of these programs. The results presented in this paper represent a first effort to synthesize these findings.

Design

The data reported in this paper were obtained from two different research projects. Study 1 was designed primarily to secure epidemiologic field survey data on the prevalence of mental health problems among the general population. The distribution of alcohol users and problem drinkers among the same population was a secondary interest, and for this reason, less information was obtained on alcohol-related behaviors. The psychiatric epidemiologic findings resulting from study 1 have been reported extensively; however, the data on alcohol use and problem drinking resulting from this study have been reported only briefly (Warheit and Auth 1984). Although studies 1 and 2 do not provide longitudinal data per se, both relied on samples drawn from the same general population and, consequently, the earlier data provide a valuable body of baseline information against which the current research findings can be compared.

Design of Study 1

Study 1 relied exclusively on statistical probability samples of the general population. This research was similar in design to the Stirling County study (Leighton et al. 1963) and the Midtown Manhattan study (Srole et al. 1962; Langer and Michael 1963). However, the Florida study was larger in scope in that it contained three interrelated components. The first component consisted of a series of socioanthropological field studies designed to determine the health attitudes, beliefs, and behaviors among the general population in the research sites. This research took approximately 1 year to complete.

The second component consisted of a comprehensive rates-under-treatment study designed to determine the prevalence of persons with mental health problems being treated in agencies and by health professionals in a variety of settings. The rates-under-treatment study also included a 10 percent sample of all medical/surgical patients receiving care in the largest general medical/surgical hospital servicing the area.

The third and most comprehensive phase of the study 1 research included a series of epidemiologic field surveys, each of which contained a basic core of items. The interview schedules included the standard social and demographic variables such as age, race, sex, and marital status. It also contained the following: 110 items designed to measure psychiatric signs, symptoms, and syndromes; 55 items related to physical health problems; an abbreviated inventory of life crisis events; 20 items related to health services utilization; and a variety of other items related to the theoretical foundations that guided the research. The interview schedule also had a small number of items designed to determine the prevalence of alcohol use and problem drinking.

The overall refusal rate for study 1 was approximately 10 percent, with a total nonresponse rate of slightly less than 13 percent. All interviews were conducted in face-to-face situations by trained interviewers. Respondents were selected by means of multistaged sampling procedures designed to select both a probability sample of households and a representative sample of respondents within them vis-a-vis the Kish technique (Kish 1965).

Design of Study 2

The research conducted in the early 1970s, together with a series of projects generated by it, served as the general guide for the second study discussed in this paper. The primary objectives of study 2 were to determine the prevalence of drinking disorders and late onset alcohol abuse among the elderly. However, extensive information was also obtained on the drinking behaviors of a cross section of the general population 18 years of age and older, with a special focus on alcohol use among blacks.

The design of study 2 included the construction of a 280-item interview schedule intended to gather an extensive array of information on a variety of health-related beliefs and behaviors. More specifically, the schedule included the standard social and demographic questions about age, sex, race, socioeconomic status, and marital history. The instrument also contained items related to work patterns, religious beliefs and practices, physical health, health services utilization, and stressful life events.

The study 2 items regarding alcohol use replicated several items from study 1. In addition, the interview schedule contained a large number of questions that elicited information about the volume, quantity, and frequency of alcohol consumption; lifetime and current abstinence; a modified version of the problem drinking scales developed by the Berkeley research group, and the abuse/dependence components of the DIS.

The interview schedules used in studies 1 and 2 were based on a comprehensive and integrated social systems approach to health and health-related behaviors which conveys the notion that persons live out their lives within a variety of contextual environments. Included are an individual's idiosyncratic characteristics; family and other primary membership groups; the social structural characteristics of the communities within which they live; and the cultural contexts of the wider society. In every instance, efforts were made to determine the key dimensions of these environments and to gather information on the health-related behaviors of respondents within these contexts.

The procedures used to select the study 2 sample were similar to those employed in study 1 in that both used households as the sampling universe and selected respondents within households using the Kish (1965) method. In study 1, households were selected at random on the basis of utility listings. The adult residents of the household were enumerated through personal contact, and the Kish tables were then used to select the appropriate respondent. In study 2, a stratified probability sample was necessary because the study was particularly directed towards persons 60 and older and towards blacks. For economic reasons, the random digit dialing techniques developed and tested by the Rand Corporation (Lucas and Adams 1977) were used. Residents of the randomly selected households were enumerated by telephone and selected using Kish (1965) selection tables. Study 2 interviewers were carefully recruited and given extensive training in the administration of the interview schedule. The average interview took about 1 1/2 hours to complete.

Near the end of the interviewing stage of the survey, staff assistants went into predominantly black areas and personally enumerated households. This enumeration was done for two reasons. First, although about 90 percent of all households in the area had telephones, those without service were predominantly black. By face-to-face enumeration, we attempted to correct the potential bias occasioned by relying only on the telephone for respondent selection. Second, this approach helped to increase the sample size among race-sex-age groups which had to be overrepresented if we were to have sufficient numbers for meaningful analysis. The supplemental enumeration in black areas facilitated the sampling and interviewing process, reduced costs, and provided adequate subsample sizes. It is important to emphasize that although there were several variations in the sample selection, all procedures relied on methods designed to produce a stratified statistical probability sample of the subgroups they were intended to represent.

It is recognized that when a multistaged sampling design is used, not all persons in the population have an equal probability of selection; as a consequence, the sample may not be representative of the general population. When appropriate, the data for future reports will be weighted before analysis is completed.

Although it would be misleading to generalize from the present sample to the total population from which it was drawn, the data presented are all based on statistical probability samples of the race-sex-age groups which constitute the analytic focus of this paper. Moreover, it is important to note that in no instance were any race-sex-age groups underenumerated proportional to their numbers in the general population. Thus, the findings presented can be viewed as representative of the various subgroups used in the analysis.

Findings

Comparison of Study 1 and Study 2

The data on frequency of alcohol consumption for the two studies are presented in table 1. Although small cell sizes in some categories dictate caution in interpreting these data, some general patterns are clear. Overall, race differences were found in both studies: whites were more likely than blacks to consume alcohol and to drink more frequently; blacks in both studies had higher percentages of abstainers than whites in all age-sex subgroups. The lowest abstinence rates were found among white males ages 18 to 29, while the highest rates were among black females age 60 and over.

In addition to this general pattern, table 1 shows an overall increase in the percentage of the population that drinks alcohol, as well as increased rates of frequent drinking. This trend has held true over the past 15 years for whites and blacks in all race-age-sex subgroups except black males ages 18 to 29 and age 60 and over. These two groups also had higher rates of abstinence in study 2 than in study 1 and, as such, represent departures from the general trend. However, these results could be affected by small cell sizes and may not be generalizable to black men in those age groups.

Another pattern shown in table 1 is that females of both races are more likely to be abstainers and to use alcohol less frequently than males in the same age group. Although a higher percentage of females in all race-sex-age groups reported frequent drinking more often in study 2 than in study 1, the percentage remained substantially lower than that of males. This pattern was especially true for whites in study 2, where nearly 40 percent of all males consumed alcoholic beverages often or every day compared with 15 percent of white females and 2.9 percent of black females.

The use of alcohol to face daily problems is an indicator of stress-related alcohol dependence. Table 2 shows the extent to which white and black respondents in both studies indicated they drank for this purpose. The findings reveal an increase of drinking to face daily problems by white males, white females, and black males over the past 10 to 15 years.

Black females, however, reported an increase of never drinking to solve problems. Of special interest is the fact that black females ages 30-59 had relatively high rates of stress drinking in both studies (i.e., 4.1 percent in study 1 and 4.3 percent in study 2). This cohort also had the highest percentage of drinkers in the often/every day category in study 2 and the second highest percentage in study 1. This finding suggests that although black females were largely abstainers and were, in general, less likely than whites to use alcohol to face problems, those black females who did drink were more likely to use alcohol for that purpose every day.

The percentage of whites and blacks reporting stress-related alcohol use remained remarkably stable over the 10 to 15 years that separated the two surveys. Overall, about 2 percent of both races indicated they drank often or every day to help face daily life situations. The highest rates of such drinking were found among black males ages 30-59, where nearly one-third indicated they used alcohol at least some of the time to deal with difficulties in living.

Table 3 displays data on the frequency of being "drunk" in the year prior to the interview. In general, the percentage of respondents reporting no episodes of drunkenness in the preceding year was relatively constant for the two study periods. The same pattern is seen for those people who said they had been drunk one or more times, with the most striking exception being black males. In that group, the percentage indicating one or more episodes of drunkenness decreased by 13 percent. Overall, white males indicated drunkenness most often and black females least often.

When analyzed by race, sex, and age, the disparity of alcohol drunkenness between the races is dramatically illustrated. For example, in study 2, 75.3 percent of the white males ages 18-29 reported at least one episode of drunkenness in the preceding year; at the other extreme, only 6.7 percent of the black females age 60 and over indicated that drinking behavior.

It is important to note that all three white male age groups reported increased frequencies of drunkenness between study 1 and study 2. The greatest change was among males age 60 and over, where the rate more than doubled. White females also showed an increase

Table 1.—Frequency of alcohol consumption for two study populations by race, sex, and age

	Sample size		Never (percent)		Seldom/ sometimes (percent)		Often/ every day (percent)	
Race/sex/age	S-1	S-2	S-1	S-2	S-1	S-2	S-1	S-2
White males	1,508	340	28.6	19.4	49.8	42.0	21.7	38.6
18-29	443	88	12.4	5.7	66.3	53.4	21.2	40.9
30-59	667	128	27.3	15.6	47.2	45.3	25.5	39.1
60+	398	124	48.7	33.1	35.4	30.6	15.8	36.3
White females	1,939	426	46.0	33.6	44.7	51.4	9.3	15.0
18-29	485	95	25.4	14.7	64.7	74.7	9.9	10.6
30-59	853	148	43.3	21.6	45.2	58.1	11.5	20.3
60+	601	183	66.6	53.0	27.8	33.9	5.6	13.2
Black males	273	91	40.3	53.8	47.9	33.0	11.7	13.2
18-29	61	13	31.1	61.5	55.7	30.8	13.1	7.7
30-59	128	19	35.9	26.3	53.9	42.1	10.1	31.6
60+	84	59	53.6	61.0	33.4	30.6	13.1	8.5
Black females	429	205	69.9	72.0	28.4	24.8	1.6	2.9
18-29	101	29	59.4	44.8	38.6	48.2	2.0	6.9
30-59	221	36	65.6	47.2	32.1	44.5	2.3	8.4
60+	107	140	88.8	84.3	11.2	15.0	0.0	0.7
N	(4,201)	(1,063)						

Table 2.—Frequency of alcohol use to solve problems for two study populations by race, sex, and age

Race/sex/age	Sample size[a]		Never (percent)		Seldom/ sometimes (percent)		Often/ every day (percent)	
	S-1	S-2	S-1	S-2	S-1	S-2	S-1	S-2
White males	1,069	306	88.8	83.0	9.5	14.7	1.8	2.3
18-29	385	85	88.6	80.0	9.6	18.8	1.8	1.2
30-59	483	120	87.0	79.2	11.4	17.5	1.6	3.3
60+	201	101	93.5	90.1	4.5	8.0	2.0	2.0
White females	1,041	322	92.2	89.8	6.8	9.3	1.0	0.9
18-29	359	87	92.8	89.7	6.4	9.2	0.8	1.1
30-59	483	124	90.5	84.7	8.0	13.7	1.4	1.6
60+	199	111	95.5	95.5	4.5	4.5	0	0
Black males	160	68	83.8	79.4	15.0	19.2	1.3	1.5
18-29	40	10	80.0	100	20.0	0	0	0
30-59	82	19	84.1	68.4	15.9	31.6	0	0
60+	38	39	86.8	79.5	7.9	18.0	5.3	2.6
Black females	126	85	82.5	89.4	14.2	8.3	3.2	2.4
18-29	41	17	78.0	82.4	19.5	17.7	2.4	0
30-59	74	23	85.1	91.3	10.8	4.3	4.1	4.3
60+	11	45	81.8	91.1	18.2	6.7	0	2.2
N	(2,396)	(791)						

[a] Includes drinkers only.

Table 3.–Frequency of being drunk in past year for two study populations by race, sex, and age

Race/sex/age	Sample size[a]		Never (percent)		At least once in past year (percent)	
	S-1	S-2	S-1	S-2	S-1	S-2
White males	1,073	306	58.9	58.8	41.4	41.2
18-29	388	85	34.5	24.7	65.5	75.3
30-59	483	119	63.6	58.0	36.4	42.0
60+	202	102	94.6	88.2	5.4	11.8
White females	1,045	320	77.0	73.1	23.0	26.9
18-29	362	86	58.3	37.2	41.7	62.8
30-59	483	124	82.6	75.0	17.4	25.0
60+	200	110	97.5	99.1	2.5	0.9
Black males	162	68	64.8	77.9	35.2	22.1
18-29	41	10	46.3	70.0	53.7	30.0
30-59	82	19	69.5	52.6	30.5	47.4
60+	39	39	74.4	92.3	25.6	7.7
Black females	126	85	77.8	80.0	22.2	20.0
18-29	41	16	63.4	50.0	36.6	50.0
30-59	73	24	86.3	75.0	13.7	25.0
60+	12	45	75.0	93.3	25.0	6.7
N	(2,428)	(788)				

[a]Includes drinkers only.

in episodes of drunkenness for the 18-29 and 30-59 age groups, but white females age 60 and over showed a decline.

The data on black males show a marked decline in rates of drunkenness for those ages 18-29 (27.7 percent) and 60 and older (17.9 percent). Among black females, there was an increase in episodes of drunkenness for those ages 18-29 (13.4 percent) and 30-59 (11.3 percent). At the same time, there was an 18.3 percent decrease in drunkenness in the preceding year for black females age 60 and over.

As mentioned earlier, tables 1, 2, and 3 must be interpreted with caution because of the small numbers in some cells. It must also be emphasized that the data are not longitudinal but were obtained from two different cross-sectional studies of a similar population at two periods. Nonetheless, the weight of the evidence strongly indicates a trend toward greater alcohol use for both blacks and whites in the past 15 years. This finding appears consistent with the current literature, which suggests greater consumption levels than in the past among most age and sex groups in the general population.

Study 2 Findings

The data presented in tables 4 through 8 deal with respondents in study 2 who reported drinking alcohol at some time in their lives; the percentages in table 9 are based on both drinkers and nondrinkers. As noted above, many of the findings must be regarded as preliminary since they are based only on one-half of the total sample.

An important issue in the field of alcohol research concerns the age at which individuals begin to drink. This issue is of interest from both theoretical and programmatic perspectives. Table 4 presents information regarding the age at which different race and sex

Table 4.—Age at which respondents first drank alcohol by race, sex, and age (study 2)

Race/sex/age	Sample size[a]	Under 18		18-25		26-40		41-59	
		N	Percent	N	Percent	N	Percent	N	Percent
White males	316	150	48.4	147	46.5	15	4.7	1	0.3
18-29	86	63	73.3	23	26.7	—	—	—	—
30-59	121	57	47.1	61	50.4	3	2.5	—	—
60+	109	33	30.3	63	57.8	12	11.0	1	0.9
White females	324	80	24.7	191	59.0	41	12.7	12	3.7
18-29	88	48	54.5	40	45.5	—	—	—	—
30-59	125	22	17.6	85	68.0	16	12.8	2	1.6
60+	111	10	9.0	66	59.5	25	22.5	10	9.0
Black males	81	30	37.0	44	54.3	6	7.4	1	1.2
18-29	10	5	50.0	5	50.0	—	—	—	—
30-59	19	8	42.1	10	52.6	0	0	1	5.3
60+	52	17	32.7	29	55.8	6	11.5	—	—
Black females	100	25	25.0	62	62.0	13	13.0	—	—
18-29	17	8	47.1	9	52.9	—	—	—	—
30-59	24	4	16.7	18	75.0	2	8.3	—	—
60+	59	13	22.0	35	59.3	11	18.6	—	—

[a] Includes drinkers only.

Table 5.—Mean scores among drinkers on selected indices of consequences of alcohol consumption by age, race, and sex (N=828)

Age/race/		Alcohol dependence index		Health problems index		Social consequences index		Three indices combined	
sex	N	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
Ages 18-29	201	1.29	(2.05)	0.13	(0.48)	0.71	(1.36)	2.13	(3.43)
White males	86	1.69	(2.00)	0.20	(0.55)	1.16	(1.66)	3.05	(3.69)
White females	88	0.84	(1.51)	0.57	(0.28)	0.39	(0.94)	1.28	(2.35)
Black males	10	2.20	(4.92)	0.30	(0.95)	0.50	(1.58)	3.00	(7.42)
Black females	17	1.06	(1.71)	0.12	(0.49)	0.24	(0.56)	1.41	(2.12)
		(F=3.31; $p<.05$)		n.s.		(F=6.04; $p<.001$)		(F=4.51; $p<.005$)	
Ages 30-59	291	1.88	(3.14)	0.23	(0.84)	0.82	(1.45)	2.93	(4.98)
White males	121	2.08	(3.05)	0.21	(0.81)	1.21	(1.67)	3.51	(5.13)
White females	127	1.43	(3.13)	0.20	(0.78)	0.34	(0.87)	1.97	(4.46)
Black males	19	3.26	(3.03)	0.47	(0.90)	1.89	(1.97)	5.63	(5.47)
Black females	24	2.12	(3.47)	0.29	(1.23)	1.58	(1.28)	3.00	(5.45)
		(n.s.; $p<.07$)		n.s.		(F=12.72; $p<.001$)		(F=4.12; $p<.01$)	
Ages 60+	336	1.58	(3.11)	0.25	(0.87)	0.59	(1.34)	2.42	(4.98)
White males	109	1.95	(3.02)	0.23	(0.60)	0.82	(1.54)	2.99	(4.81)
White females	113	0.54	(2.23)	0.11	(0.59)	0.18	(0.72)	0.82	(3.42)
Black males	53	3.26	(4.42)	0.62	(1.60)	1.28	(1.87)	5.17	(7.35)
Black females	61	1.39	(2.54)	0.21	(0.73)	0.34	(0.91)	1.95	(3.95)
		(F=10.86; $p<.001$)		(F=4.48; $p<.005$)		(F=10.92; $p<.005$)		(F=10.81; $p<.001$)	

n.s. = not significant.

groups began to drink alcoholic beverages. For both races, a large percentage of those who drink began consuming alcohol before their 18th birthday. A higher percentage of white males (48.4 percent) began drinking before age 18 than any other race-sex group. For black males, the comparable percentage was 37 percent. The percentage of white and black females who began drinking before age 18 was nearly equal (25 percent). The overwhelming majority of all drinkers began using alcohol before age 26. For white males, 95 percent began drinking by age 26, while for white females, the figure was 83.7 percent. Among blacks, 91.3 percent of the males and 87 percent of the females began drinking alcohol by that age. Very few persons began to use alcohol after age 40. However, of special note is the fact that 9 percent of white females age 60 and over reported that they began consuming alcohol after age 40.

Although there are variations within the different race-sex-age groups, an overall pattern exists for the various age cohorts as well. In table 4, it may be seen that the older respondents in every instance, began drinking later than the younger ones. This finding is consistent with commonly held beliefs regarding the decreasing age at which persons begin consuming alcohol in our society. The data in table 4 also indicate that blacks of both sexes began consuming alcohol at a later age than whites and that females of both races began drinking later than males.

Thus far, data have been presented which describe various patterns of alcohol use among whites and blacks. In this section, the use of alcohol is further examined from two perspectives. The first of these analyzes alcohol use in light of its consequences, and the second examines its use within a psychiatric diagnostic context.

One of the crucial problems in alcohol research is that of defining the dependent variable. This problem is evident given the multiple definitions of alcoholism that are reported in the literature. Such definitions range from classifying alcoholism as a disease to defining alcohol use or abuse as a moral or ethical failure. A useful approach to defining alcoholism has evolved from the Alcohol Research Group at Berkeley, where researchers developed a series of scales to measure problems and consequences related to alcohol consumption (Room 1977; Clark and Midanik 1981; Clark 1981) such as alcohol dependence, problems with police, accidents, loss of control, health worries, job consequences, binge drinking, spouse problems, and problems with friends and relatives. Clark (1981) identified 24 basic items for use by those interested in a problems/consequences approach to alcohol research. For purposes of the present study, these 24 items were incorporated into an interview schedule along with 13 other items so that the objectives of the research would be met. These 37 items have not yet been tested for scalability and, for this reason, are presented in this paper in the form of indices. Three indices were constructed based on work done by the Berkeley group and on the face validity of the items and are labeled as indices of (1) alcohol dependence, (2) health problems, and (3) social consequences. Table 5 reports the findings on the problem indices. As the data are considered, it must be kept in mind that the items primarily reflect advanced stages of abuse and dependence, and, therefore, the mean scores will be low.

Alcohol Dependence Index

The alcohol dependence index comprised 17 items which reflect drinking behaviors, perceptions, and attitudes commonly associated with dependence on alcohol. Table 5 presents the mean number of affirmative responses to the 17 dependence items for the race-sex-age groups. The differences in mean scores were tested for statistical significance by using analysis of variance.

The highest mean scores on the alcohol dependence index were found in the 30-59 year age group and the lowest in the 18-29 year age group. This finding may seem inconsistent with data presented earlier, which showed that those in the 18-29 year age group tended to drink more often and had a greater frequency of drunkenness than those in older age groups. The most plausible explanation for this incongruity lies in the nature of the items which are indicative of serious dependence. In some instances the consequences occur only after long-term use of alcohol. Thus, respondents in the younger age groups have not had the time to "mature" into the advanced stages of dependence. It is also possible that the higher mean scores for ages 30-59, when compared with those age 60 and over, may reflect the lowered consumption of alcohol among older persons. The reduction of alcohol intake among those of increasing age has been discussed by Straus (1984), who identified a number of factors, including the reduced tolerance of alcohol, as contributing to lowered levels of ethanol intake among older persons.

Black males ages 30-59 and 60 and over had the highest mean scores (3.26). No other group approached this magnitude. The lowest mean scores were found for white females age 60 and over (0.54) and for white females ages 18-29 (0.84). In every instance, blacks had higher mean scores than their white sex-age counterparts on the alcohol dependence index.

When the mean scores were analyzed for the race-sex groups controlled for age, statistically significant differences were found in each case. In the 18-29 age group, black males had the highest scores (2.20) and white females the lowest (0.84). White males had scores that were slightly higher than those of black females. Among those in the 30-59 age group, both black males and females had higher scores than either of the white groups. The overall score differences were significant except at the $p < .07$ level. The scores for those age 60 and over were significantly different ($p < .001$), with black males having the highest scores in this age group and white females the lowest. The scores of white males were closer to those of black females than they were to those of white females.

The data in table 5 clearly indicate that blacks of both sexes reported a higher number of alcohol dependency behaviors than their white comparison groups. This pattern emerges even though whites reported more frequent consumption of alcohol than blacks and, in most instances, indicated more episodes of drunkenness.

Health Problems Index

The health problems index contained 10 items. Similar to the alcohol dependence index, the mean scores are low because almost all are indicators of serious health problems such as vomiting blood, pancreatitis, yellow jaundice, and blackouts. It should also be pointed out that the questions were asked within the context of alcohol consumption in order to eliminate as much as possible causal factors that are not associated with drinking.

Table 5 shows that the highest mean scores were found among people age 60 and over (0.25). These scores were slightly higher than those for people in the 30-59 age category (0.23), although the differences were not statistically significant. Those under age 30 had much lower scores (0.13) than either of the older groups. As one might expect, these data suggest that the serious health consequences associated with alcohol abuse accumulate over time.

When the within-group data were analyzed, it was found that white females ages 18-29 had higher mean scores (0.57) than any other race-sex group in this age category. Among all age groups, these scores were surpassed only by black males age 60 and over. In contrast, the scores of black females under age 30 were the second lowest (0.12) of any group. The difference in the scores for the various 18-29 age subgroups, however, were not statistically significant. Data for the race-sex groups ages 30-59 show that black males had the highest scores, followed by black females. The scores for both white groups were almost identical. Again, there were no statistically significant differences in scores for this age group.

The score variations on the health consequences index were greater among those age 60 and over than for the two younger age groups. The differences were significant at the $p < .005$ level, with black males having the highest scores (0.62) of any group in the entire sample and white females having the lowest scores (0.11). The scores of white males (0.23) and black females (0.21) were very similar.

The data on the health consequences index indicate a very low overall prevalence of health problems—a finding that is not surprising given the magnitude of the symptoms and syndromes included in the index. Although there was little variation between the scores of the various race-sex-age groups, some general patterns were observed. Blacks of both sexes tended to have higher scores than their white comparison groups, except persons 18-29 years old. White females in this group had the highest mean scores. These high scores among young white females are an anomaly and are unlikely to be a statistical artifact. The sample size ($N = 88$) is fairly large, and the standard deviation is very small, especially when compared with all other standard deviations reported in the table. The reasons for these higher-than-expected scores must undergo more detailed analysis. Aside from this finding, alcohol use appears to have more deleterious health effects for blacks than for whites.

Social Consequence Index

The use of alcohol, particularly when associated with high levels of consumption, often leads to negative social consequences, including the verbal disapproval of significant others and more overt sanctions on the part of police and employers. The social consequences index consists of nine items which reflect the social outcomes of alcohol use. The data on this index are presented in table 5.

In general, persons 30-59 years old had the highest mean social consequences scores, and those age 60 and over had the lowest. When analyzed by race and sex, significant differences were found within each age group. White males ages 18-29 had the highest mean scores, and black females ages 18-29 had the lowest. Males had higher scores than females for both race groups in the 18-29 cohort. Altogether, the mean scores for those people ages 18-29 were significantly different at the p < .001 level of confidence.

The data for the 30-59 age group indicate that black males had the highest scores, followed by black females. In this age group, black females had higher scores than white males, and white females had the lowest scores. The mean score differences were significant (p < .001).

The mean scores for those age 60 and over were highest among black males and lowest among white females. White males in this age group had higher scores than those of either female category. White females 60 and older had the lowest scores of any race-sex-age group in the sample. Once again, the within-group mean score differences were statistically significant (p < .001).

At a very general level, the findings shown in table 5 could be predicted from the data shown in table 1 (i.e., frequency of alcohol consumption) and from the data presented in table 3 (i.e., frequency of being drunk in the past year). Together, the data in tables 1, 3, and 5 indicate that, regardless of race, there is a positive relationship between alcohol intake and the number of social consequences experienced. However, these same data suggest that blacks experience a disproportionate number of social consequences compared with whites. Although blacks reported less frequent use of alcohol and fewer episodes of drunkenness than whites, they tended to experience a greater number of social consequences as a result of their drinking. This was particularly true for blacks 30 years of age and older.

The finding that blacks indicated more social consequences of drinking than whites, despite the fact they tended to drink less, has several possible explanations. First, blacks may be more willing to admit to having experienced social consequences. Another possibility is that there may be different alcohol tolerance levels for the two racial groups. A third plausible explanation is that blacks, because of their minority status, are more vulnerable to being stopped by the police, to being arrested, or to losing their jobs as a consequence of drinking. It is also possible that although blacks as a group are less likely to drink than whites, those blacks who do drink may be inclined to drink to excess or to be more visibly abusive when they drink. At present, definitive arguments cannot be made for any of the possible explanations, but they will be explored as additional data become available.

Composite Index

In order to get a comprehensive overview of the problems experienced by different race-sex-age groups, a composite index based on all 37 items was created as represented in table 5. It is important to note that the scores represent the mean number of affirmative responses to the individual items.

The data on age, race, and sex show that the 30-59 age group had the highest overall mean scores (2.93) and that the 18-29 age group had the lowest (2.13). Black males 30-59 years old had the highest scores of any group in the sample (5.63), and white females age 60 and over had the lowest scores (0.82). Black females had higher scores than white females in all three age groups, and the scores for black males were higher than those for white males ages 30-59 and 60 and over. The scores for white males ages 18-29 were only 0.05 higher than those of black males the same ages. Generally, then, it can be concluded that blacks of both sexes had higher scores than whites on the composite index and that this pattern existed for most of the race-sex-age groups. Analysis of variance showed that the between-group score differences were statistically significant for all three age cohorts with respect to both gender and race. The findings reported for the composite index mirror the general patterns found for the three separate indices of alcohol consequences. The same problems of interpretation are present when one attempts to account for the discrepancies between the use of alcohol and its subsequent consequences.

The reader is reminded at this point that not all of the data from study 2 have been collected and that the data on potential consequences of drinking as presented in table 5 are preliminary. Perhaps some of the incongruities found in these tables are attributable to small cell sizes and will disappear as the sample sizes are increased. In addition, these analyses did not control for the frequency, volume, quantity, and duration of alcohol use. Perhaps a more easily understood pattern will emerge as the problem items are analyzed in relation to more discrete measures of alcohol intake. Nonetheless, it is likely that the overall findings will remain relatively constant when the final results are reported. More specifically, it is probable that, as a group, whites will report a greater and heavier use of alcohol than blacks. Further, it is postulated that blacks will continue to report more consequences of their drinking than whites even when the data are controlled for quantity, frequency, and other drinking variables. This rationale is based on the belief that there are important racial and cultural differences in the reasons why people drink, in the locations where they drink, and in the social contexts of that drinking. It also seems to hold true that blacks, as a minority group, are treated differently from whites under similar circumstances involving alcohol use.

Diagnostic Interview Findings

The second way in which the data have been analyzed reflects a quite different approach from the problems/consequences framework detailed above. The DIS, as noted earlier, was developed primarily as a psychiatric interview schedule for use in epidemiologic field surveys of the general population. The instrument represents an important forward step for psychiatric epidemiologists in that it provides them with a valid and reliable method for making several specific DSM-III diagnoses. The DIS also has value for alcohol epidemiologists in that it makes it possible to enumerate the prevalence of alcohol abuse and alcohol dependence in the general population from a psychiatric perspective.

The DSM-III includes three separate alcohol diagnoses: alcohol-related brain syndromes, alcohol abuse, and alcohol dependence. Although the DIS includes a number of items that secure information on the alcohol-related brain syndromes, the items do not encompass the full range of symptoms and dysfunctions outlined in the DSM-III. For this reason, no attempt was made to establish this diagnosis in this study. The DIS does, however, embody a full range of questions that permit researchers to make the diagnoses for alcohol abuse and alcohol dependence and, further, to do so with or without exclusions. The wave II (St. Louis) version of the DIS was used here to obtain information on abuse and dependence. The diagnoses discussed below were made so as to exclude, as much as possible, nonalcohol-related factors which might be producing the symptoms/dysfunctions by which the DIS clinical assessments are determined. Although there are individual diagnoses in the DSM-III, data on them have been combined since the number of cases for each diagnosis is small. In addition, this array allows presentation of the findings in a format compatible with preliminary results reported by the ECA researchers. It is important to keep this in mind as the findings are interpreted.

The abuse/dependence data are presented in table 6. The findings are displayed to show three points of observation: (1) those who met the DSM-III criteria in the past year only, (2) those who did not meet the criteria during the past year but who did so at an earlier time in their lives, and (3) a total of all who met the criteria for abuse/dependence at some time in their lives.

The data in table 6 come from all 1,063 respondents, not only from those who had consumed alcohol at some time in their lives. For this reason, the percentages are lower than they would be if only drinkers were included. This approach was chosen in order to provide a broad epidemiologic statement regarding the entire population.

The findings on abuse/dependence during the past year indicated that white males had the highest annual prevalence rates for diagnosed alcohol problems. Of all white males in the sample, 8.8 percent met the DSM-III criteria for abuse/dependence during the year prior to being interviewed. This rate was closely approximated by that for black males (7.7 percent). The overall past year prevalence rate for black females (1.9 percent) was slightly greater than that for white females (1.6 percent), despite the fact that no black female under age 60 met the DSM-III criteria. Among all race-sex-age groups, black males ages 30-59 had the highest abuse/dependence rates (21.0 percent). The next highest percentage was found for white males ages 18-29 (15.9 percent). The highest rates for females were found among whites ages 18-29 (3.2 percent). No one among three race-sex groups (all black)–black males ages 18-29 and black females ages 18-29 and ages 30-59–met the abuse/dependence criteria.

The prevalence rates of alcohol abuse and/or dependence 1 or more years prior to the interview are slightly different from those for the past year. Black males were found to have the highest overall rates of prevalence. In this group, 17.6 percent of all black males met the DSM-III criteria for alcohol abuse/dependence at some time in their lives. White males had the next highest rates, with 14.4 percent of them meeting the same criteria. Black females had a lifetime prevalence rate of 4.9 percent, and white females had a rate of 3.3 percent.

Table 6.–Prevalence of alcohol abuse and/or dependence[a] by race, sex, and age

Race/sex/ age	Sample size	Percent past year only	Percent 1 or more years ago	Percent lifetime
White males	340	8.8	14.4	23.2
18-29	88	15.9	11.4	27.3
30-59	128	8.6	14.8	23.4
60+	124	4.0	16.1	20.1
White females	424	1.6	3.3	4.9
18-29	95	3.2	2.1	5.3
30-59	148	2.0	4.7	6.7
60+	181	0.6	2.8	3.4
Black males	91	7.7	17.6	25.3
18-29	13	0	7.7	7.7
30-59	19	21.0	15.8	36.8
60+	59	5.1	20.3	25.4
Black females	205	1.9	4.9	6.8
18-29	29	0	6.9	6.9
30-59	36	0	8.3	8.3
60+	140	2.8	3.6	6.4

[a] Based on DIS/DSM-III criteria.

The within age group analyses showed a general inverse relationship between age and lower prevalence rates for the two male groups. Black males age 60 and over had a 20.3 percent rate, and white males in this cohort had a rate of 16.1 percent. In contrast, black males ages 18-29 had a rate of 7.7 percent, and white males in the same age group had a rate of 11.4 percent.

The lifetime rate of abuse/dependence was determined by combining the "past year only" and "1 or more years ago" categories. The findings show that black males had the highest lifetime rates (25.3 percent), followed closely by white males (23.2 percent). Black males ages 30-59 had the highest rates overall, with 36.8 percent of this age cohort meeting the criteria for a lifetime diagnosis of alcohol abuse/dependence. The lowest rates were found among white females age 60 and over (3.4 percent).

Black females had higher lifetime rates of abuse/dependence than white females. This finding was shown for blacks as a group, and it was found for the individual age groups as well. The lifetime rates for black females (6.8 percent) and for white females (4.9 percent) were strikingly lower than those found for their male counterparts. This finding illustrates, once again, that although females report more drinking behaviors than they formerly did, they still lag far behind males for abuse/dependence.

The inclusion of the DIS alcohol abuse/dependence questions in the Florida study (study 2) permits comparisons between the results produced with those found at three ECA sites: New Haven, St. Louis, and Baltimore. The ECA data are from the work reported by Helzer et al. (1984). Although there are some differences in the way the ECA and Florida projects established break points for those under 60 years of age, the categories are similar enough to permit useful comparisons. The findings reported are prevalence rates of alcohol abuse/dependence for the 6 months prior to the interview.

The data presented in table 7 indicate that the rates of alcohol abuse/dependence in the Florida sample are very similar to those reported by the ECA investigators. The only notable exceptions were found among black males under age 30, where the sample size is

Table 7.—Comparison of ECA[a] and Florida DIS 6-month prevalence rates of alcohol abuse/dependence by race, sex, and age

Race/sex/ site	Age group 18-39	40-59	60+
White males			
New Haven	11.1	6.5	1.8
St. Louis	11.7	6.8	3.7
Baltimore	14.1	9.2	4.8
Florida[b]	11.4	5.5	4.0
White females			
New Haven	3.3	1.1	0.1
St. Louis	1.6	0.1	0.6
Baltimore	2.1	1.2	0.4
Florida	3.2	2.0	0.6
Black males			
New Haven	10.7	6.7	3.7
St. Louis	8.8	7.4	2.3
Baltimore	8.4	21.6	4.5
Florida	0	21.0	3.4
Black females			
New Haven	3.1	4.4	0
St. Louis	1.1	1.7	1.4
Baltimore	2.5	4.2	0.6
Florida	0	0	2.1

[a] Helzer et al. (1984).

[b] There are slight variations in the age groupings for the ECA and Florida projects. The three age groups in the Florida study are 18-29, 30-59, and 60+.

quite small, and among black females in the two younger age cohorts. White females ages 30-59 and black females age 60 and over in the Florida sample had slightly higher rates than those found for comparable groups in the three ECA sites. Overall, however, the findings were very similar for the Florida and ECA projects.

The data on the 6-month prevalence of alcohol abuse/dependence for the several projects indicate that black males in the middle-age group in the Baltimore and Florida studies had the highest individual rates. About 21 percent at both sites met the DSM-III criteria for alcohol abuse/dependence in the 6-month period prior to their being interviewed. Among females, blacks in that same age group had higher rates than those in the younger or older age cohorts. The only exception to this was found among black females age 60 and over in the Florida sample.

The most consistently high abuse/dependence rates were found for white males in the youngest age group. Approximately 11 to 14 percent of this group met the diagnostic criteria for abuse/dependence. Black males in the same age group had relatively high rates as well. It may be that the higher rates among those under age 40 are probably related to abuse rather than to dependence, whereas the very high rates for black males ages 40-59 are more likely to reflect alcohol dependence.

The data in table 7 indicate, again, that females of both races had much lower rates of abuse/dependence than males. This was the case in every race-age category. Females over age 60 in both race groups had the lowest overall rates of alcohol abuse/dependence.

Summary

The paucity of alcohol research on black populations prevents systematic, detailed comparisons of the Florida findings with those reported by other investigators. The data being produced by the ECA projects and the Alcohol Research Center programs supported by NIAAA will increase greatly the epidemiologic data on black alcohol use in different parts of the country and in the United States as a whole. Although preliminary in nature, the data presented in this paper suggest that, contrary to popular thinking, blacks abstain from alcohol use more often than whites. The findings also show that whites tend to report more episodes of drunkenness than blacks. However, the consequences of alcohol use are more pronounced for blacks than they are for whites. This was found for the composite index of problems and consequences for the DIS diagnoses of alcohol abuse/dependence.

In conclusion, it is important to emphasize that sex and age were found to be far better predictors of alcohol use and/or abuse than was race. Moreover, the data presented indicate unequivocally that alcohol use and its consequences are extremely complex phenomena which defy simplistic descriptions or unicausal explanations. It is evident that additional basic epidemiologic research is required before precise quasi-experimental designs can be meaningfully used to investigate the causes and prevention of alcohol abuse.

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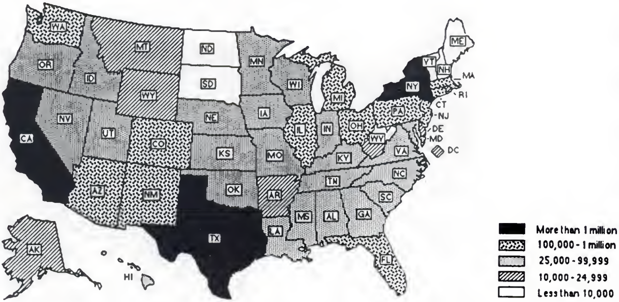
II.

Alcohol Use Among Hispanic Americans

The Hispanic Population: 1980



Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1986* (106th edition) Washington, D.C. 1985

Selected Social and Economic Characteristics of the Hispanic Population: 1985

	Total	Percent
Population	16,940,000	100.0
Under 15 years old	5,164,000	30.5
15-44 years old	8,550,000	50.5
45-64 years old	2,407,000	14.2
65 years old and over	819,000	4.8
Years of school completed		
Persons 25 years old and over	8,455,000	100.0
Elementary: 0-8 years	3,192,000	37.7
High school: 1-3 years	1,210,000	14.3
4 years or more	2,402,000	28.4
College: 1-3 years	932,000	11.0
4 years or more	718,000	8.5
Labor force status		
Civilians 16 years old and over	11,528,000	100.0
In civilian labor force	7,448,000	64.8
Employed	6,664,000	60.1
Unemployed	785,000	4.7
Unemployment rate*	—	10.5
Total families	3,939,000	100.0
Married couples	2,824,000	71.7
Female householders†	905,000	23.0
Male householders†	210,000	5.3
Median family income, 1984	$18,833	na‡
Persons below poverty level, 1984	4,806,000	28.4

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1987* (107th edition) Washington, D.C. 1986.

* Total unemployment as percent of civilian labor force. † With no spouse present ‡ not applicable

Alcohol-Related Practices, Problems, and Norms Among Mexican Americans: An Overview

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ABSTRACT

This review summarizes what has been learned about the alcohol-related practices of Mexican Americans, noting particular problems in the research and pointing out areas in need of investigation. Regional similarities and differences in drinking prevalence, levels of drinking, and rates of problems are described. The drinking patterns of Mexican Americans are compared with those of the general U.S. population and those of people in Mexico in order to isolate possible ethnically unique patterns. Norms undergirding alcohol use are discussed and what is known about the social context of drinking among Mexican Americans is described. Two issues related to acculturation are highlighted: an assessment of the kind and degree of acculturative change that appears to be taking place within the ethnic group, and the hypothesized role played by stresses related to acculturation in the etiology of alcohol abuse in this population.

Integrated into the discussion of these issues are data from two studies hitherto unreported: a cross-cultural ethnographic study of blue- and white-collar Anglo and Mexican American couples, and findings from a reanalysis of a three-community survey of Mexican American drinking practices and attitudes completed in 1977 under a California Office of Alcohol and Drug Programs contract.

Introduction

Although Mexican Americans constitute 4 percent of the U.S. population and 60 percent of the 15.9 million Hispanics in the United States, there are no baseline national survey data on alcohol consumption patterns and alcohol-related problem rates for this group. Published studies based on national samples contain small Hispanic subsamples that aggregate Puerto Ricans, Cubans, and Central and South Americans. In general these studies demonstrate that consumption among Hispanic drinkers, especially males, is heavier than that of the larger population (Cahalan et al. 1969; Clark and Midanik 1981, 1982), but there is no definitive research that indicates the extent to which Mexican Americans, or any Hispanic subgroup, is at greater risk of alcoholism or alcohol-related problems. Available information on Mexican American drinking practices comes from regional or localized community surveys, ethnographic studies, and a small amount of statistics summarizing medical and/or social indicators of alcohol-related problems.

This review focuses solely on studies relating to Mexican Americans and attempts to bring together the scattered information on their alcohol consumption norms, practices, and problems. The data available are scrutinized and evaluated in order to suggest areas in special need of research attention. This review is restricted to two types of research: those studies that address alcohol-related issues among samples designated as Mexican American and those studies that, because of their locale, assure that a very high proportion of groups categorized as "Latino" or "Hispanic" are of Mexican heritage. All studies reviewed with samples labeled "Latino" or "Hispanic" are at least 85 percent Mexican American. Unfortunately, few studies of alcohol patterns among youthful Mexican Americans (those under 18 years of age) exist. Consequently, this review omits this population and confines its research focus to adults.

This review begins with an assessment of the demographic descriptors of Mexican Americans and the implications of these characteristics for alcohol use. Next, drinking prevalence, consumption patterns, and problem rates from several regional studies are reviewed and analyzed. Issues centering on the relationship between acculturation and alcohol use in this population are examined. Comparisons are made between recent epidemiological data from Mexico and from the U.S. general population to provide a sound research premise for assessing the acculturative change suggested by new data on the drinking patterns of Mexican Americans. Findings concerning alcohol-related norms and attitudes among Mexican Americans are reviewed, and attention is given to recent ethnographic studies that describe the social context of alcohol use among Mexican Americans. The paper concludes with identification of several specific areas in which research is needed.

Characteristics of the Mexican American Population and Their Implications in an Alcohol-Related Context

In 1980, 60 percent of all Hispanics in the United States (nearly 9 million persons) were of Mexican heritage. Mexican Americans constitute one of the fastest growing subpopulations in this country, a population that almost doubled between 1970 and 1980. This growth stems from both immigration and a relatively high birth rate (Santiestevan and Santiestevan 1984). The demographic characteristics of Mexican Americans suggest that the group may be at particularly high risk for the development of problems associated with alcohol use.

The median age of Mexican Americans (24.1) is significantly younger than that of the general U.S. population (30.1). About one-fourth of all Mexican Americans are now 10-17 years of age, compared with only 19 percent of all Americans (Santiestevan and Santiestevan 1984). The youthfulness of the Mexican Americans is particularly important because the heaviest drinking for the general population, particularly men, occurs between the ages of 18 and 30 years (Clark and Midanik 1982). Most of the available data on Mexican American drinking patterns indicate that, as with other Americans, the twenties are the years of heaviest consumption (Caetano 1983*a*). Therefore, a very high proportion of Mexican Americans are in or about to enter the heavy drinking years–a proportion much higher than that of the general population.

Nationally, males make up less than half of the general population (48.6 percent) but they make up slightly over half of the Mexican American population. And, to an even greater extent than in the general population, Mexican American men form the bulk of the drinking and heavy drinking segments of their population (Caetano 1983*a*,*b*; Trotter 1985). Based on these two demographic factors alone, Mexican Americans may be at considerably higher risk to develop alcohol-related problems. However, other factors related to alcohol use also should be considered.

Mexican Americans are unevenly distributed throughout the United States. Four states–California, Texas, Arizona, and Illinois–contain 82 percent of this ethnic population, with nearly 42 percent residing in California alone. Hispanics in California, most of whom are of Mexican heritage, are rapidly increasing in number–82 percent between 1970 and 1980 (Santiestevan and Santiestevan 1984). This growth is expected to continue or to accelerate, bringing the largely urban Hispanic population to a majority in California near the year 2000 (Hayes-Bautista et al. 1983). California is one of the "wettest" States in the nation in terms of alcohol consumption patterns and alcohol availability. In 1972, California's per capita consumption was exceeded only by that of Alaska, Vermont, and Nevada, and its alcoholism rate was topped only by that of Nevada (Smart 1980). Using eight factors of legal beverage control, Smart reported an alcohol availability score of 36 for California, assessed in a range of scores from 16 to 44 across the 50 States. Thus, a significant proportion of the very large, young Mexican American population are in or are entering their twenties in a region of especially high drinking activity and alcohol availability.

The potential effects of other demographic factors are equally disquieting. The median family income for Mexican Americans in 1979 was $15,000, which is $4,500 less than the median for all American families. Nearly 70 percent of Mexican Americans work at blue-collar occupations with only 12 percent in professional or managerial jobs. Numerous researchers have noted that individuals in the lowest occupational categories and with the lowest social status have proportionally higher percentages of heavy drinking males and drinkers with problems (Cahalan and Room 1974; Vaillant 1983) although they do not have higher prevalence or frequency rates (Marden 1980). The relationship between heavy drinking and socioeconomic status should be further explored, but the relatively low economic position of a vast majority of Mexican American males may add to their risk of developing alcohol problems.

The family, long considered a source of strength for Mexican Americans, is undergoing considerable erosion. From 1970 to 1981, the divorce rate for Hispanics rose from 81 to 146 divorced persons per 1,000 active marriages. Comparable 1981 figures for whites were 118 per 1,000 and for blacks, 289 per 1,000 (The status of Latinas 1983). Families maintained by Hispanic women comprise 23 percent of all Hispanic families compared to 15 percent in the general population (Gay 1984). Available data indicate that, as with the larger population, divorced status is predictive of higher rates of alcohol consumption and problems among Mexican Americans (Caetano 1983*a*). Thus, these high rates of divorce offer potential risk for alcohol-related problems for Hispanic men and women.

These probable risk factors are even more critical in light of research documenting the overaccessibility of alcohol in regions of heavy Mexican American population density. Watts and Rabow (1983) noted in a study of 213 California cities that one particular type of alcohol outlet, the beer bar, is significantly correlated with Hispanic population concentrations. Burns (1983) examined 18 Los Angeles County Alcohol Program Planning Regions and learned that in the western San Fernando Valley, where the population was just 9 percent Hispanic (and the poverty rate 5 percent), there were 10 alcoholic beverage outlets per 10,000 people; but in central Los Angeles, where the Hispanic population was 55 percent (and the poverty level 17 percent), the number of outlets per 10,000 was 24. Therefore, an already "wet" environment is even wetter for California's population of Mexican descent.

The demographic profile of the Mexican American population contains dimensions other than those outlined above and implications much broader than the alcohol-related context provided here. However, this alcohol-focused demographic description should be kept in mind as research on the drinking practices and patterns of Mexican Americans is reviewed below.

Drinking Prevalence and Consumption Rates Among Mexican Americans

Alcohol-related research on Mexican Americans has centered in two States: Texas (especially the Lower Rio Grande Valley) and California. This narrow geographical focus is to some extent appropriate because the highest concentrations of Mexican Americans are found in these areas. However, it is also problematic since it limits our ability to assess the extent of intracultural variation across the broader Mexican American population, including regional subgroups such as those in Arizona, Illinois, New Mexico, and Michigan.

The question of intracultural diversity looms especially large because alcohol consumption patterns and practices among Mexican Americans in Texas appear to differ significantly from those of Mexican Americans in California. However, it is difficult to determine whether this diversity reflects actual variation in drinking habits or is an artifact of the different research approaches used in the two States. Surveys conducted in California tend to focus on random samples and utilize constructed quantity/frequency measures and standardized alcohol problem and dependency scales (e.g., Caetano 1983*a*,*b*, 1984*a*,*b*; Alcocer 1979). Conversely, a major portion of the Texas studies do not use probability samples or standardized measures, but concentrate on norms and attitudes rather than behavior (e.g., Johnson and Matre 1978; Maril and Zavaleta 1978; Paine 1977; Trotter 1985). The various studies also use different measures for drinking categories; for example, "abstainer" in one study may indicate a lifetime abstainer, while in another study the term may describe an individual who has not drunk an alcoholic beverage in the past 6 months. Comparisons across studies using such variant measures are thus tenuous at best (Room 1971).

Research on Mexican Americans in the border area of southern Texas (Maril and Zavaleta 1978, 1979; Trotter 1982, 1985) shows a relatively low prevalence of alcohol consumption. Maril and Zavaleta (1978), for example, found abstention rates of 43 percent for males and 83 percent for women in their sample of low income Mexican Americans in Brownsville. These rates are twice as high as those in a 1979 national sample analyzed by Clark and Midanik (1982): 25 percent for men and 40 percent for women. Trotter (1985), although providing no figures, reported that abstention rates for both Mexican Americans and Anglos in the Lower Rio Grande Valley are much higher than national rates. Neither Trotter nor Maril and Zaveleta employed probability sampling in their research: Trotter did not specify his sampling methodology, and Maril and Zavaleta's sampling strategy eliminated all Mexican Americans not "traditional" in orientation and emphasized low income families. Reports of male drinking in the Maril and Zavaleta study are not self-reports but spousal reports of questionable validity in a culture frequently reported as exceptionally segregated in its drinking activities according to sex (Trotter 1982; Gilbert 1985*a*).

Two other studies (Paine 1977; Johnson and Matre 1978) reported data from a sample of low income residents of the Magnolia neighborhood in Houston. These researchers noted slightly higher lifetime abstention rates for Anglo men than Mexican American men: 20 percent and 15 percent, respectively. But for women the opposite was true: 84 percent of the Mexican American women were abstainers in contrast to just 38 percent of the Anglo women.

A recent probability sample drawn from the entire Texas population (Tuchfeld et al. 1983), and, unfortunately, not disaggregated by gender, revealed a 51 percent abstention rate for Mexican Americans—a rate considerably higher than the 38 percent found for the general population. (The report does not indicate whether the rate was calculated for current or lifetime abstainers.) Judging from this study and others, it appears that abstention characterizes at least one-half of the Mexican Americans in Texas. However, the exceptionally high abstention rates of Mexican American women contribute significantly to this overall low rate, masking in the aggregate the much lower rate of abstention among males in this group.

In California, the proportion of Mexican American abstainers is usually lower than that in Texas. Cahalan (1975) found a 3 percent rate of abstention (i.e., individuals had not drunk alcohol within the past year) among Mexican American males as compared with a 10 percent rate for Anglo males; for Mexican American women, abstention was higher (29 percent) than the 17 percent noted among Anglo females. In a study of Los Angeles County, Belenko and Kehrer (1978) aggregated current and lifetime abstainers and revealed these abstention rates: Mexican American males, 39 percent; Anglo males, 30 percent; Mexican American women, 64 percent; and Anglo women, 43 percent. Alcocer (1979) studied 603 Spanish-speaking persons in East Los Angeles, rural Fresno County, and San Jose. For this group, 88 percent of whom were Mexican American, abstention rates for men ranged from 24 percent in the East Los Angeles barrio to just 12 percent in urban San Jose. For women, abstention rates ranged from 59 percent in East Los Angeles to 28 percent in San Jose. Finally, Caetano (1983*a*), analyzing a primarily Mexican American sample from three northern California communities and using an abstention measure identical to Alcocer's (i.e., aggregating "not in the last 6 months" or "never"), obtained abstention rates of 14 percent for men and 32 percent for women.

Whereas these California studies document a rather wide range in abstention rates among Mexican Americans, they clearly show that California's Mexican Americans are far less likely to be abstainers than their Texas counterparts. It is possible, however, that some of the contrasts may result from different research designs or the heavier sampling of urban areas in California.

Regardless of geographical focus, one finding from the above studies is strikingly clear: Gender is an important factor in accounting for abstention rates in Mexican American populations. Although rates range from Paine's (1977) very traditional 5.6:1 ratio of male-to-female drinkers in Texas, to Caetano's (1983*a*) 2.3:1, Alcocer's (1979) 2.2:1, and Balenko and Kehrer's (1978) 1.6:1, the data consistently reveal that Mexican American men are far more likely to be drinkers than their female counterparts. This gender difference is more distinct than in the larger population; in national surveys, Harris (1971) noted a ratio of 1.5:1 male-to-female drinkers, and Clark and Midanik (1982), 1.6:1. The enormous discrepancy between Mexican American male and female drinking prevalence rates (and drinking levels, as will be discussed later) makes it imperative for researchers studying this population to disaggregate their data by gender in order to more clearly understand use of alcohol.

For information on drinking levels among Mexican Americans, the studies undertaken in California, specifically those of Alcocer (1979) and Caetano (1983*a*,*b*, 1984*a*,*b*), constitute the only studies that provide quantity/frequency measures of Mexican American drinking comparable to those used in studies of the general population. Caetano's research is especially informative, since he contrasted a sample of Anglos with a large sample of northern California Hispanics, 80 percent of whom are Mexican American. Thus, insights into cross-cultural differences in drinking patterns were gained.

Table 1 compares drinking levels by gender for the general U.S. population (Harris 1971), a California sample (Caetano 1983*b*), and two samples of California Hispanics (Hispanic 1 from Caetano 1983*b*; Hispanic 2 from Gilbert and Maldonado, work in progress). There were proportionately fewer abstainers among males in each of the three California samples than among males in the general U.S. population. Similar findings were noted among females, with one exception: One of the two Hispanic samples had substantially higher proportions of female abstainers (55 percent) than in the U.S. population (44 percent). Although the abstention rate among Hispanic males in the second sample closely approached that of the U.S. population, the other two California samples included comparatively fewer abstainers. Men in all California samples exceeded national proportions in the heaviest drinking category. The higher proportion of the Hispanic 1 men in the frequent heavy drinker category is the single indicator of heavier drinking among Hispanics. When the two heaviest drinking categories of males are aggregated, California males look remarkably alike across ethnic groups, and all are demonstrably different from the national sample in their heavier drinking patterns.

White females in California also appear to be the least likely to abstain and the most likely to fall into heavier drinking categories. In terms of their drinking habits, white and Hispanic women in Caetano's sample resembled each other more than they resembled women in the national sample. More of these northern California women appear in the three lighter drinking categories than in the national sample. It seems that many women in California, including a sizable number of Mexican Americans, are becoming at least occasional and infrequent drinkers.

The lower levels of drinking among men and women in Alcocer's study are difficult to explain. However, his sample included persons from three very different regions in California: The East Los Angeles barrio, urban San Jose, and three tiny towns in rural Fresno County. On the other hand, Caetano's Hispanic sample came from three contiguous, highly urbanized counties in the San Francisco Bay area of northern California. At least some of the differences visible across the two Hispanic samples may reflect the rural/urban variation embedded in Alcocer's group.

Although detailed quantity/frequency data from other areas with high concentrations of Mexican Americans are lacking, some roughly comparable information on Mexican American consumption patterns in Texas is available from a 1982 Behaviorial Risk Factor Study (Texas Department of Health 1983), which used a statewide probability sample of 1,840 persons, 16 percent of whom were Hispanic. Comparisons between Anglo and Hispanic Texans are depicted in table 2. It appears that Texas men, both Anglos and Hispanics, drink less than Californians and that ethnic differences across both genders in Texas are fewer than in California. Ethnic groups within Texas and California tend to resemble each other more than they do their counterpart groups in the other State, although this trend is somewhat less true among women. In each region, the two ethnic samples appear to differ from the national sample (as seen in table 1) in the same general way. These comparisons, although rough, seem to suggest that regional environmental factors affect the general population and ethnic groups similarly. The overall conservativeness of Mexican Americans and whites in Texas reported by Trotter (1985) and other Texas researchers mentioned earlier seems to reinforce this probability. The possibility of cross-cultural regional effects is an interesting one, and the concentrations of Mexican Americans in these two States and in Illinois and Arizona provide an opportunity to explore this question.

Only a few researchers have examined intra-ethnic variation in alcohol consumption patterns within or across samples of Mexican Americans. Likewise, few have investigated links between social and demographic factors and within-group differences in consumption practices.

Caetano (1983*a*) found that for males, drinking and higher drinking levels were linked to being young, Catholic, separated or divorced, and employed. Income, education, and occupational status tended to be positively related to drinking and higher consumption, as was found in some studies of the general population (Clark and Midanik 1982; Cahalan et al. 1969). The relationships among these variables, however, were not significant for Mexican American males. On the other hand, drinking and heavier consumption were positively linked with education and income for women. Caetano's research also found that lower consumption among females–particularly younger females–was more

Table 1.—Percent comparison of consumption levels among Californian Hispanics with the Californian and U.S. general populations by gender

	Male				Female			
Drinking level	United States	California	Hispanic 1	Hispanic 2	United States	California	Hispanic 1	Hispanic 2
Abstainer	30	11	14	27	44	29	32	55
Occasional	8	9	6	8	18	19	20	18
Infrequent	14	13	17	16	18	23	24	14
Frequent low maximum	14	20	16	6	12	14	14	4
Frequent high maximum	23	26	21	22	10	9	7	6
Frequent heavy maximum	12	21	26	21	3	6	3	3
N	(1,053)	(1,047)	(279)	(242)	(1,067)	(1,280)	(355)	(366)

Sources: U.S. data from Harris (1971); California and Hispanic 1 data from Caetano (1983*b*); Hispanic 2 data from Gilbert and Maldonado's secondary analysis (work in progress) of Alcocer's 1979 data.

Table 2.–Percent distribution of alcohol consumption levels in Texas by gender and ethnicity

Drinking	Male		Female	
level	Hispanic	Anglo	Hispanic	Anglo
Abstainer	27	23	45	36
Light	34	35	45	46
Moderate	20	24	6	13
Heavy	19	18	4	5

Source: State of Texas, Department of Health (1983).

strongly associated with marriage than it was among men. Being a housewife was negatively related to consumption. These data seem to suggest that the generally lower levels of alcohol consumption among Mexican American females respond more sensitively to variation in life circumstances than do the higher levels of males.

Holck and colleagues' (1984) study of Mexican American and white females in 51 border counties also documents a strong positive linear relationship between education levels and alcohol consumption among Mexican American females. Interestingly, when educational level was held constant, the differences in consumption between Mexican American and white females almost disappeared. These researchers also found that employed females consumed more alcohol than those unemployed. Apparently many of the role-related and socioeconomic factors associated with increasing alcohol consumption among females in the general population are also affecting Mexican American females. Although the relationship between females' changing roles and responsibilities and alcohol use has been examined among women in the general population, results are inconclusive (Wilsnack and Wilsnack 1978; Keil 1978). Mexican American females, with their clearer division between traditional and modern roles and documented internal variation in alcohol use patterns, constitute an excellent population in which to examine the impact of changing roles on alcohol use.

Incidence of Alcohol-Related Problems Among Mexican Americans

The alcohol-related problems covered in surveys of Mexican Americans usually relate to marital, friendship, family, legal, employment, and financial concerns (Caetano 1983*a*; Cahalan and Room 1974). Some studies also probe the occurrence of dependency symptoms such as morning shakes, inability to stop drinking when there is a reason to do so, gulping drinks, and blackouts. As with measures of quantity and frequency, the problems included and the scales derived from the measures vary enormously across studies, making only general comparisons possible. The small amount of comparative data available (Caetano 1983*a*) show that Mexican Americans have alcohol-related problems similar to those of other Americans. Ethnic differences are apparent in terms of the number of problems and the ages at which problems occur.

National surveys conducted a decade ago indicated that Hispanics experienced an unusually high number of alcohol-related problems (Cahalan et al. 1969). A more recent national study (Clark and Midanik 1982) demonstrates the persistence of high rates of problem and heavy drinking among Hispanics. Mexican Americans, as a major Hispanic subpopulation, share these high rates. Caetano (1983*a*) found a much higher rate of alcohol-related problems in his predominantly Mexican American sample than was found in other surveys using the same problem indices:

> . . . the proportion of males with "one or more problems" in this survey (35 percent) is 2.5 times higher than reported by Cahalan, et al. (1974) for California (14 percent) and for the U.S. surveys of 1967 and 1973 (14 percent and 18 percent, respectively). The rate of 11 percent for females with "one or more problems" is twofold that found by Cahalan et al. (five percent) and similar to the nine percent reported for the national sample.
>
> (p. 226)

Further, Caetano learned that, in contrast to patterns in the larger population, problem prevalence did not drop off immediately after the heavy drinking ages of 18 to 29 years old (Clark and Midanik 1982) but continued very high through the thirties and decreased only slightly in the forties. Caetano's current analysis of a national Hispanic sample, 900 of whom are Mexican American, discloses that reported alcohol-related problems take an upward turn among Mexican American men in the 40-50 age group (Caetano, personal communication). These same patterns also surfaced in the Texas study by Tuchfeld and colleagues (1983): Among Hispanic males, problem rates were more than twice those of non-Hispanics, and reported problems persisted into middle age. Substantiating these high problems levels, although not by age level, Johnson and Matre (1978) reported that about one-fifth of their Houston Hispanic families suffered problems related to alcohol use. Surprisingly, however, 90 percent of the Brownsville women studied by Maril and Zavaleta (1979) reported no alcohol-related problems in their families.

Pertinent information about a very serious alcohol-related problem is provided by the Texas Commission on Alcoholism. An examination of alcohol-related deaths occurring in Texas during 1983 reveals that while the percentage of alcohol-related deaths among Mexican American males was proportional to their representation in the State's population (18 percent), the proportion of Mexican Americans dying at much younger ages was greater than for Anglo men. Forty-one percent of the Mexican American deaths occurred among men below 50 years of age, compared with 30 percent for Anglo deaths among men in this age group. Whereas just 58 percent of the Anglos died before the age of 60 years, 72 percent of the Mexican Americans did so. Given that epidemiologists label deaths occurring before 64 years of age as "premature," these data strongly suggest that an extraordinarily high number of Mexican American men die prematurely of alcohol-related causes.

Data from a previous study of autopsies performed at the University of Southern California Medical Center between 1918 and 1970 (Edmandson 1975) also substantiate this finding: Alcohol was found to be related to 52 percent of all deaths for Mexican American men 30 to 60 years of age, in contrast to just 24 percent for Anglo men in the same age category.

What factors account for alcohol-related deaths at younger ages and the persistence of alcohol-related problems late into the lives of Mexican American men? The correlation between problem prevalence and heavy or intoxication level drinking has been well documented. Among the U.S. general population, drinking levels decline steadily after the twenties, and so, correspondingly, does problem incidence (Clark 1982). In Mexico, this parallel decline does not take place (Roizen 1983; Natera and Terroba 1982) nor, apparently, does it in the United States among Mexican Americans. For example, data from Caetano's northern California Hispanic study (1984*a*) show the highest proportion of male heavy drinkers in the 18-29 age group (34 percent) just as in the larger population. But, unlike the national pattern, a quite sizable percentage of men in the 30-39 age group are still drinking heavily. The results of a secondary analysis (Gilbert and Maldonado, work in progress) of data collected in Alcocer's California study are shown in table 3. Here again there is little reduction in the two heaviest drinking categories from the twenties to the thirties, and nearly half the drinkers in the 40-49 age group also are categoried in these drinking levels.

Caetano (1984*a*) has explored the connection between heavy drinking, frequency of intoxication, and problem prevalence among California Hispanics. Following Clark's (1982) example, Caetano asked respondents how often in the previous 12 months they had consumed enough alcohol to become drunk. As with the heavy drinking indicator, and correlated with it, the incidence of intoxication level drinking remained high among these males through their thirties and forties, dropping sharply thereafter. Twenty-two percent of the 18-29 age group, 22 percent of the 30-39 age group, and 17 percent of the 40-49 age group reported intoxication once a month or more often. Gender differences were very apparent: 60 percent or more of the females in each age group reported no intoxication in 12 months, and only about 6 percent of the females in the three youngest groups drank to intoxication monthly.

Comparing this sample with Clark's national sample revealed striking differences in the rate of intoxication-level drinking across age cohorts. For example, intoxication-level drinking was five times higher among Hispanic men in the 30-39 age group than in the general population and three times higher for Hispanic females than other females in that same age group. Caetano found that the number of alcohol-related problems was significantly and positively related to both the number of drinks consumed per month and the frequency of intoxication-level drinking. Since these rates did not decline, as was also the case for the

Table 3.—Consumption levels among male Hispanic drinkers in California by age, in percent

	Age			
Drinking level	18-29	30-39	40-49	50+
Abstainer	19	36	28	34
Occasional	9	0	8	13
Infrequent	17	14	11	21
Frequent low maximum	4	4	5	13
Frequent high maximum	24	22	27	13
Frequent heavy	27	24	19	13
N	(108)	(50)	(37)	(42)

Source: Gilbert and Maldonado (work in progress).

larger population, neither did the rate of alcohol-related problems (Caetano 1984*a,b*).

The persistence of very high rates of heavy drinking and problems in older age groups found in many of these studies suggest that drinking is integrated into Mexican American male developmental stages differently than in the general population. Something in these men's lives allows heavy drinking to continue or prevents the reduction of drinking from taking place.

Fillmore (1984) has pointed out that cohort, cross-sectional studies such as those examined here, show overall relationships between age and drinking practices. Longitudinal studies, however, in which the same group of men are studied at several points in time, disclose what cohort studies cannot; that is, most individuals who drink heavily or experience alcohol-related problems in their twenties usually do not experience those problems in their thirties. More important, these longitudinal studies, none of which has included Hispanic subsamples, reveal that the probability of maintaining a given level of drinking, or the chronicity of that level, varies in different age cohorts; i.e., if an individual is frequently drinking to intoxication in his twenties, he is more likely to reduce than to continue that level into his thirties. If a man begins drinking or is still drinking at high levels in his thirties and forties, however, he is more likely to maintain those high levels as he ages (Fillmore and Midanik 1984). Correspondingly, whereas youthful drinkers report more problems associated with alcohol, alcohol-related problems are more chronic after age 30.

The high rates of intoxication level drinking and problems reported among Mexican American males after 30 years of age, together with the incidence of early death, seem to suggest the probability of greater chronicity of heavy drinking and associated problems among males in this ethnic group. However, without longitudinal studies, this conjecture is uncertain. Moreover, the social patterns that might promote chronicity cannot be understood without ethnographic studies of drinking. These are two areas in special need of further research.

Acculturation and Mexican American Drinking Patterns

A great deal of conjecture but very little empirical research has focused on the relationships that are assumed to exist between Mexican American drinking patterns and the process of acculturation. Attempts to place the drinking practices of Mexican Americans into an acculturation context usually involve one of two approaches. In the first approach, the stresses related to acculturation are assumed to be significant in the etiology of heavy drinking among Mexican Americans (Dobkin de Rios 1979; Galan 1978; Graves 1967; Holck et al. 1984; Madsen 1964; Trotter 1985). In the second approach, changes in the drinking patterns of Mexican Americans are hypothesized to result from exposure to, and adoption of, dominant society norms and practices (Gilbert 1985*a,b*). One major difficulty in either approach is that data on Mexican American drinking practices, as previously mentioned, come from cross-sectional studies. Since these studies have not been conducted in the same locale over time, changes in drinking practices cannot be traced. Acculturative change has simply been inferred when, for example, education is taken as a measure of exposure to dominant society norms and has been shown to be positively correlated with drinking levels (Graves 1967; Holck et al. 1984). More important, no research has yet compared drinking patterns across generational groups, despite the fact that the generational depth of the Mexican American population affords a rich opportunity to do so. And, until recently, few data on drinking patterns in Mexico were available, so it has been difficult to determine the extent to which drinking patterns of Mexican Americans in the United States resemble or contrast with Mexican patterns.

When considering the effects of acculturation on a population's drinking patterns, it is important to keep the two approaches outlined above analytically distinct. A vast difference exists between using alcohol as a coping strategy for the relief of stresses created by adaption to new life circumstances and acquiring different drinking patterns as an adaption to new norms for behavior. Keeping the two processes distinct is a difficult methodological problem, and little, if any, research among Mexican Americans yet exemplifies its solution.

Empirical data on the relationship between stresses associated with acculturation and alcohol use are obtained from two studies: Madsen's ethnographic treatment of the "alcoholic agringado" in southern Texas (1964) and Graves' (1967) examination of acculturation and deviant drinking in a Colorado community. The conclusion reached in both studies was that heavy or deviant drinking occurred when a Mexican American identified with the norms of the larger society but economically was unable to achieve the lifestyle associated with them. This situation alienated the individual from Mexican cultural traditions but did not allow that individual to integrate with the mainstream. Deviant alcohol use was thus seen to be linked to the stress engendered by cultural marginalization.

Unfortunately, the sample used in each study was small. In Graves' research, genders were aggregated, and measures not originally designed for measuring acculturation were employed.

The underlying premise in these studies is that stress causes individuals to use or abuse alcohol, or that people drink with the expectation that it will relieve tension and stress. The argument is similar to that used for explaining the higher incidence of heavy drinking in certain occupational groups (Cosper 1979) or for drinking and role conflict among women (Keil 1978). Such post hoc explanations are problematic in their circularity; but perhaps more important is that, as Lemert (1972) points out, such a view of drinking as symptomatic from a psychological perspective is reductionistic and not useful for explaining group patterns. Moreover, Cappell and Herman (1972), after an extensive review of alcohol and stress research, noted that while the notion of stress in the etiology of alcohol abuse is intuitively plausible, it has received little empirical support. Sher and Levenson (1984) and Williams (1985) emphasized the importance of individual variation in the tension- and stress-reducing effects of alcohol and noted that their own research demonstrates stress reduction only for certain individuals on a limited number of measures and only at high dosages. Thus, the reinforcing effect of physiological responses to alcohol is not likely to explain the patterns demonstrated by an entire ethnic group.

On the other hand, Marlatt (1984, p. 281), who also has examined the stress/alcohol relationship in a variety of experiments, concludes that "drinking will increase only in those situations perceived to be stressful and for which the individual expects alcohol to reduce the tension or stress." Marlatt points out that little support exists for the idea that consumption of alcohol is associated with a simple linear decrease in levels of stress. Nevertheless, considerable evidence supports the notion that individuals who maintain a socially conditioned belief that alcohol will provide relief from stress will report tension reduction after consuming alcohol. These perceptions are clearly in line with the theoretical formulations, based on ethnographic comparisons, put forward by MacAndrew and Edgerton (1969) in their cross-cultural treatment of drunken comportment. Little is known about whether culturally conditioned or widely shared expectations about the effects of alcohol exist among Mexican Americans. This issue points to potentially fruitful and important lines of inquiry, particularly if approached comparatively both within and across ethnic boundaries.

It is somewhat surprising that so little effort has been made to investigate the possible changes in Mexican American drinking patterns that could result from acculturative incorporation of U.S. majority society drinking behaviors. One obstacle, recently removed by the World Health Organization (WHO), was a lack of information on Mexican drinking patterns. In 1976 WHO conducted a cross-national study of alcohol consumption patterns and community response to alcohol problems in three countries: Mexico, Scotland, and Zambia (Roizen 1981, 1983). Concurrently, the Alcohol Research Group conducted a parallel study in California, thereby adding a fourth comparison group

(Roizen 1983). The results of these studies revealed that the patterns in Mexico were strikingly different from those in Scotland and California, which were nearly identical in many respects. Essentially the study showed that Mexican females were either abstainers or infrequently drank very small quantities of alcohol. Mexican males, however, were far more likely to be abstainers or infrequent drinkers than Americans, but they drank much more heavily each time they did drink. In California, 37 percent of the males drank almost every day, but only 7 percent became intoxicated as often as once a month; in Mexico, only 13 percent of the males drank almost every day, but 25 percent became intoxicated at least monthly, and in rural Mexico, 45 percent of the males reported intoxication at least once a month (Roizen 1981). Caetano (1984*c*, p. 2) has emphasized that in Mexico, drunkenness is "frequent not only among more frequent drinkers but among all drinkers." In contrast, he noted elsewhere (1984*b*) that in his study of Hispanic males residing in California, 21 percent of the weekly drinkers, 4 percent of the monthly drinkers, and 4 percent of the less than monthly drinkers became intoxicated each time they drank. These data seem to indicate that Mexican American males are adopting a pattern of less frequent intoxication, more nearly approaching U.S. practices.

An acculturation model, based on the assumption that succeeding generations of Mexican American men and women will become more like the general U.S. population in their drinking habits, incorporates the expectation that Mexican American women will drink more as well as more often and that Mexican American men will drink more often but less heavily with each succeeding generation. This model was recently tested by comparing the consumption practices of Mexican Americans with those of Mexicans living in Mexico (Gilbert and Maldonado, work in progress). A comparison of drinking frequencies among three generations of Mexican American men and women drinkers with the Mexicans and Californians in the WHO study mentioned earlier is shown in table 4. Comparison across male samples shows a distinct pattern of increase in drinking frequency, starting with the Mexicans as baseline and continuing through successive generations of Mexican Americans. By the third generation, Mexican American men are more like other Californians than like immigrants or Mexicans, though it is interesting, and as yet inexplicable, that immigrant men seem to drink with greater frequency than men living in Mexico. Only about one-fourth of the third generation Mexican American men drink less frequently than once a week, whereas 71 percent of the Mexican men and 40 percent of the immigrants drink at lower than weekly frequencies. For reasons that remain unclear, the major increase in the proportion of men in the higher drinking frequencies occurs between the second and third generations.

For women, generational differences are more subtle: Succeeding generations show a stepwise movement out of the lowest and into the middle drinking frequencies. However, Mexican American women in the third generation have not come to resemble women in the California general population in their drinking frequency as have third generation Mexican men. Women in the general population are substantially represented in the higher drinking frequencies, but relatively few women in any of the Mexican American generational groups drink as frequently. Nevertheless, a persistent trend toward more elevated frequencies is observed if Mexican women are used as baseline and successive Mexican American generations are examined.

The changes in drinking frequency visible across the three generations of Mexican American men and women clearly appear to follow the expected trend posited in a simple acculturation model: Mexican Americans drink at increasingly higher frequencies than Mexicans, thus converging on patterns found in the dominant society.

The comparative frequency of drunkenness reported by Mexican, Californian, and three generations of California Mexican American men are summarized in table 5. Women were excluded from this table because the number of women who reported intoxication was too small to analyze. The results presented should be viewed somewhat cautiously since eliminating men for whom Mexican heritage was not certain and restricting the analysis to drinkers drastically reduced the number of responses analyzed. Another problem in comparing these self-reports is that the wording of questions differed somewhat: Mexican men and the men in the California general population were asked how frequently in the last year they had had enough alcohol to become "drunk"; Mexican Americans were asked how often in the same span of time they had gotten "high or tight," a term perhaps indicative of a slightly more sober state than "drunk." Among the Mexicans and Californians who were asked the same question, more Mexicans reported frequent intoxication. The increase in the percentage of male drinkers who got high or tight across the three generations of Mexican Americans is opposite to what an acculturation model would predict (i.e., Mexican

Table 4.—Frequency of drinking among Mexican, Mexican American, and Californian drinkers by gender, in percent

Drinking frequency	Male					Female				
		Mexican American[a] generation					Mexican American generation			
	Mexico	First	Second	Third	California	Mexico	First	Second	Third	California
Almost daily or more often	13	20	21	38	37	6	7	3	4	18
3–4 times per week	2	10	7	15	20	1	0	7	7	14
1–2 times per week	14	20	33	21	20	0	7	16	19	22
2–3 times per month	15	16	14	15	8	1	10	15	23	16
Once a month or less often	56	34	24	11	15	91	76	59	48	30
N	(302)	(70)	(57)	(47)	(215)	(93)	(41)	(61)	(75)	(197)

Sources: Mexico and California data from Roizen (1983). Mexican American data from Gilbert and Maldonado (work in progress).

[a] Only individuals of Mexican ancestry for whom generational status could be determined are included.

Table 5.—Frequency of drunkenness among Mexican, Mexican American, and non-Hispanic male drinkers, in percent

Frequency of intoxication	Mexico	Mexican American[a] generation: First	Second	Third	California non-Hispanic
Less than once a year	25	38	48	16	51
Less than once a month, but at least yearly	43	19	10	28	38
Monthly	23	32	29	23	7
Weekly or more often	8	11	13	33	4
N	(297)	(47)	(25)	(38)	(210)

Sources: Mexico and California data from Caetano (1984c); Mexican American data from Gilbert and Maldonado (work in progress).

[a]Only individuals of Mexican ancestry for whom generational status could be determined are included.

Americans would become intoxicated less frequently than immigrants).

Combining quantity/frequency into categories across several studies, the same pattern of increase in high frequency heavy drinking across generations is found (table 6). The immigrant group resembles the U.S. population, with more abstainers and more men in the heavier drinking categories than the Mexican sample, but with fewer men in the higher categories than the California general population sample. Second-generation Mexican American men and men in the California general population are almost equally represented at the heavier drinking levels, and abstention has decreased significantly in this native-born group. The group of third generation Mexican Americans contains an alarmingly high proportion (34 percent) of drinkers in the high frequency, heavy drinking category. To determine whether most of the third-generation men may have been younger than men in the other two groups, age was controlled for; the contrasts remained significant.

Clearly, something is occurring other than a mere substitution of U.S. for Mexican drinking patterns. To find an answer to this mixed pattern (i.e., an acculturative trend in frequency of consumption but an apparent reluctance to relinquish the high consumption levels characteristic of Mexican males), the scant literature on drinking patterns and acculturation among other American ethnic groups was reviewed. Blane's (1977) examination of drinking across three generations of Italian Americans, the single study in which alteration in drinking practices across generational groups was explored, showed some striking parallels to the findings on Mexican Americans. Italian American immigrants bring to this country patterns of drinking frequency much higher than those of Americans in the general population, i.e., higher levels of absolute alcohol consumption because of high drinking frequencies, but lower levels of consumption per occasion. Blane found that drinking frequency did, in fact, decrease across the succeeding generations but was still higher among third-generation Italian Americans than in the general population. However, episodes of heavy drinking per occasion ("peak drinking"), a pattern typical of U.S. males, increased by generation, especially among men, until a much higher proportion of third-generation Italian Americans fell into the frequent heavy drinking classification than did men in the general population. Blane (1977, p. 1339) remarks that this phenomenon "appears to be an instance when a recently learned cultural element (peak drinking) combines with a declining but still powerful old cultural norm to result in the acceleration of a drinking pattern to levels greater than usual in the host country."

The cross-generational pattern discovered among Mexican Americans in California suggests a similar selection and blending of donor and host country drinking practices, the difference being that peak drinking patterns of the parent society are joined with the higher frequency practices of the United States. Acculturation in the U.S. "melting pot" appears to produce a dangerous brew! It seems very important, therefore,

Table 6.—Percent comparison of alcohol consumption patterns among Californian Hispanics, Mexicans, and Mexican Americans with the Californian and U.S. general populations by gender

Sex and drinking level	United States	California	California Hispanic	Mexico	Mexican American[a] generation First	Second	Third
Male							
Abstainer	30	11	14	19	39	20	13
Occasional	8	9	6	30	9	8	8
Infrequent	14	13	17	25	14	19	15
Frequent low maximum	14	20	16	—	6	5	11
Frequent high maximum	23	26	21	26[b]	22	26	19
Frequent heavy	12	21	26	—	10	22	34
N	(1,053)	(1,047)	(279)	(355)	(90)	(64)	(53)
Female							
Abstainer	44	20	32	42	75	51	38
Occasional	18	25	20	40	12	25	16
Infrequent	18	24	24	9	9	11	25
Frequent low maximum	12	14	14	—	2	2	9
Frequent high maximum	10	14	7	18[b]	1	7	6
Frequent heavy	3	3	3	—	2	4	6
N	(1,067)	(1,280)	(355)	(196)	(111)	(104)	(103)

Sources: U.S. data from Harris (1971); California data from Caetano (1983*b*); Mexico data from Caldron et al. (1981); Mexican American data from Gilbert and Maldonado (work in progress).

[a] Only individuals of Mexican ancestry for whom generational status could be determined are included.

[b] For Mexican data, the three heaviest drinking categories were aggregated.

to discover more about the social factors mediating these cultural blends. Research focused on the relationship between acculturation and drinking practices in the Mexican American population deserves top priority.

Norms Guiding Alcohol Use Among Mexican Americans

A discussion of the norms and social patterns surrounding and controlling alcohol use among Mexican Americans is reserved for last since this author believes it is more useful to present first a generalized picture of consumption patterns and then to identify the normative and social context from which those patterns derive. Information on alcohol norms and alcohol-related social milieu comes from two sources. Many of the surveys previously mentioned also gathered data on alcohol-related attitudes (Alcocer 1979; Caetano 1983*a*; Maril and Zavaleta 1979; Trotter 1982, 1985; Tuchfeld et al. 1983). In addition, several ethnographic studies (Trotter 1985; Gilbert 1979, 1984, 1985*a*,*b*) provide contextual background for understanding how the norms guiding alcohol use are integrated into everyday life. In the Rio Grande Valley of Texas, Trotter used what he termed a "spiral methodology," which combined ethnographic techniques and survey research. The California research by Gilbert consisted of open-ended, indepth interviews and participant observation of the activities of 36 couples over 9 months. Half the couples were Anglo, half were Mexican American, and these subsamples were further broken down into blue- and white-collar groups. Information from these ethnographic studies is used here to amplify or give context to the normative and attitudinal data from survey research.

Without exception, the surveys of Mexican Americans reported attitudes that reflect greater permissiveness for male drinking than for female drinking. Mexican American men and women were both shown to be more restrictive in their views about the propriety of a woman's drinking or drunkenness in a variety of settings and social situations (Caetano 1983*a*; Maril and Zavaleta 1979; Trotter 1985). While this double standard in attitudes about gender and alcohol consumption also prevails in the larger society, it appears to be far more pronounced among Mexican Americans. Trotter (1985) sees restrictions on female drinking as based on concepts of purity, respect, and family honor that enclose women in a protective atmosphere and limit their access to alcohol. Aside from the norms prohibiting young men from drinking in front of their parents, Trotter does not discuss other norms associated with male drinking.

Among blue-collar Mexican American men in California (Gilbert 1984), the right to use alcohol appears reciprocally linked with the male provider function within a culturally sanctioned configuration of rights and duties accruing to the male adult role. (This right does not figure at all in the set of rights and obligations attached to the female role.) Frequently, for instance, a man is pronounced old enough to drink, not on the basis of age, but because he holds down a full-time job. Many men expressed the feeling that as long as they fulfilled their roles as providers, their drinking habits should not be subject to question. The importance attached to this male role configuration varied by class and ethnicity among the couples studied: Blue-collar Anglo males (but not their wives) generally took the view that a hard day's work earned them the right to a couple of beers after work, but none expressed the view that it entitled him to a generalized, unsanctioned drinking pattern. White-collar men and women of both ethnic groups did not ascribe to this set of role-associated patterns for men or women but tended to define drinking rights for either sex as being earned by compliance with situationally defined comportment norms. For example, a person has the right to drink if he does not make a fool of himself, if he does not do embarrassing things, and/or if he is not obnoxious.

Studies in widely scattered regions document a greater leniency for male drunkenness among Mexican Americans than among Anglo Americans. Tuchfeld and his colleagues (1983) found that while attitudes in the Texas general population were largely negative toward drunkenness, a significantly higher proportion of Hispanics agreed with the statement, "Personally, I enjoy getting drunk once in a while." Caetano (1984*a*), in contrasting Anglos and Hispanics in California, found acceptance of male drunkenness higher among Hispanic men and women than among Anglo men and women, though, surprisingly, acceptance of female drunkenness was higher among Hispanic than Anglo women. From the data on consumption patterns reported earlier in this paper, it appears that these attitudes may be behaviorally expressed in the high rates of intoxication and heavy drinking among Mexican American men.

Comparatively few people in any of the surveys gave "relief from worries," "anger," or "frustration" as reasons for drinking or getting high, though Johnson and Matre (1978) found that Houston Hispanics were more likely than Anglos to say that they had a few beers "to unwind." Studies in California (Gilbert 1979, 1985*a*) also disclosed that "time-out" attitudes are associated with work break and after work beer drinking among migrant field workers and urban factory workers. To what extent the attitudes associated with "time-out" and "relaxation" drinking incorporate expectations about the tension-reducing properties of alcohol specifically or the enjoyment of leisure time activities in general has not been determined.

From all accounts, Mexican Americans tend to endorse primarily convivial or sociability reasons for drinking, including, to some extent, heavier drinking. Seventy-eight percent of Alcocer's (1979) California respondents, for example, cited "celebrating" as a reason for drinking, followed by 55 percent who chose "to be sociable" and 29 percent "to relax." They were also more approving of getting high or intoxicated at a party, celebration, or get-together with friends than at home alone or with spouse or family.

"Socializing," "celebrating," and "partying," however, may have different meanings and contexts from one group to another. The patterning of companions, occasions, events, and contexts of "drinking to be sociable" or "to relax" appears to distinguish some groups of Mexican Americans from members of the larger society. Ethnographic research in Texas (Trotter 1985) and California (Gilbert 1984) disclosed the importance of sex segregation in Mexican American social drinking milieus, pointing out the clear preference of males for drinking in small groups of intimate male friends. Trotter described, for example, the "pachanga," an occasion for beer drinking, barbecue, and conversation which is almost exclusively a male social event. He reported that if Mexican American women drink, they do so in social settings involving men and women together such as dance halls and nightclubs. Gilbert found that this sex segregation in drinking milieu, while most characteristic of working-class Mexican Americans, also was evident to a lesser extent among working-class Anglos but was not as prevalent among middle-class Anglos or Mexican Americans.

In California, blue-collar Mexican American men tended to do most of their drinking in groups comprising long-term buddies and kinsmen (Gilbert 1985*a*,*b*). Although persons move in and out of a core group of regulars at a neighborhood beer bar, these groups were more localized as to neighborhood and more durable than those of blue-collar Anglos, whose drinking groups were generally job oriented. White-collar Anglos and Mexican Americans did not have male drinking groups. For most middle-class men, wives were the most frequent drinking companions.

Members of the blue-collar Mexican American drinking groups often worked together, played on the same soccer team, and frequently had attended school together. Drinking for these men was a means of consistently reinforcing close, long-term male bonds that made up a major portion of their social and emotional lives (Gilbert 1985*b*). Their drinking behavior, therefore, was subject to judgment only by their kinsmen or very close friends. Except at major family celebrations such as weddings and baptisms, these men were rarely subject to the sanctions of outsiders and strangers. These male drinking groups, often gathering in the late afternoon around a car in someone's driveway and sometimes adjourning to a nearby beer bar, frequently captured a major portion of a blue-collar Mexican American man's leisure time, thus leaving little opportunity for the development of nondrinking recreational activities. It seems possible that this particular lifestyle integration of alcohol use could produce drinking patterns resistant to developmental changes in a man's life cycle and, hence, result in the chronic patterns of heavy drinking and problems visible in the survey data.

Middle-class Mexican American men and women, as reported in the California ethnographic study (Gilbert 1984, 1985*a*,*b*), have drinking patterns and surroundings remarkably different from those of the blue-collar population just described. The range of activities associated with alcohol use is much wider, and the number and categories of people incorporated into these diverse scenarios vary from small, close kin and friend groups to large civic or social gatherings. A much higher proportion of drinking involves both men and women. Sex segregated drinking sanctioned by both men and women, however, does take place. For example, women drink wine or wine punch at female gatherings such as luncheons and showers. More women in the middle class work and are involved in work-related drinking occasions. Both men and women drink in contexts in which they are subject to the sanctions of nonintimates: bosses, bosses' wives, work and professional associates, civic group members—a wide array of people whose drinking norms are unknown and whose negative judgments could adversely affect their public personas. There also is the much more frequent presence of a watchful spouse whose own public image is somewhat dependent on the behavior of a husband or wife. Thus, the set of informal social controls operating in the lives of middle-class Mexican Americans is more restrictive than those guiding the drinking patterns of blue-collar persons. The social milieu surrounding middle-class Mexican American drinking is associated with greater and more frequent drinking among women and more frequent but lighter drinking among men. Therefore this study makes clear that, within the ethnic group, social structural factors are associated with discrete drinking environments, and these in turn give rise to variations in norms and behaviors affecting the use of alcohol.

The findings of the California ethnographic study only can be viewed as tentative since the sample was small and purposive rather than random. Nevertheless, the data suggest that variables measuring similar aspects of drinking milieu could be very useful in large-scale studies that examine class, age, and acculturation factors as they relate to Mexican American drinking practices.

Conclusions

Clearly, the puzzles and questions raised by the research reviewed here demand answers. The question of regional differences raised by contrasts between California and Texas requires resolution, and surely attention must be paid to Mexican Americans living in other regions. More information is needed about other aspects of intra-ethnic variation as well, since both survey and ethnographic findings suggest class differences in norms and behaviors related to alcohol use.

A better understanding of the processes of acculturative change associated with altered lifestyles is required. For example, what changes in the roles of Mexican American women as a result of increased education, income, and exposure to dominant society norms are related to higher levels of drinking? How do processes related to acculturation operate differently among Mexican American men and women? Are there particular and measurable stresses related to acculturation, and can these be related to patterns of alcohol use? How can we design research separating the stresses related to acculturation and acculturation itself?

Both longitudinal and qualitative studies are necessary to illuminate the reasons for the persistence of heavy drinking and problems late into the lives of Mexican American men. Do Mexican American men fail to age out of heavy alcohol use, and if so, why? Are, as has been suggested, differences in the type of drinking companions, settings, and occasions for drinking linked to different drinking habits, and do these habits predict chronicity in heavy drinking and drinking problems?

Finally, there is a great need for research on the alcohol patterns of young Mexican Americans. Little is known about alcohol socialization practices within this ethnic group and very little good information is available on other factors affecting alcohol use among adolescents.

In researching these questions, the adoption of both survey and qualitative research methodologies is urged. Indepth, on-the-ground participant observation and other ethnographic techniques are needed to generate hypotheses and uncover important variables and cultural patterns that can then be explored in larger scale research. Culturally specific lifestyle patterns are very difficult to consider in surveys unless preliminary exploration through qualitative research has led to informed instrument design. By the same token, generalizations about an ethnic group as large and as varied as the Mexican American population require survey approaches and cannot be safely made on the basis of small, nonrandomized local samples. Both perspectives are needed to provide a social epidemiology of alcohol problems in this ethnic group.

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State-of-the-Art Review: Caribbean Hispanics and Their Alcohol Use

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ABSTRACT

This paper examines alcohol use among Puerto Ricans, Dominicans, and Cubans in the United States. First, alcohol abuse among Puerto Ricans is reviewed and compared to drinking among Cubans and Dominicans. Then, contrasts are made between Dominican, Cuban, and Puerto Rican youth. A review of the literature shows that too little attention has been given to the dynamic interaction between the drinker and his or her environment. Research emphases are proposed to better understand moderation in drinking and drinking-related problems. The paper concludes with some general suggestions for an epidemiology of alcohol use that may further our knowledge of Caribbean Hispanic drinking.

Introduction

The Population

This discussion of alcohol use among Caribbean Hispanics examines Cubans, Dominicans, and Puerto Ricans and their descendants residing in the United States. They are grouped together because of their common language, their similar plantation agricultural background, and their recent migration to the United States. These Hispanic groups share patterned social relations stemming from the rural plantation economy. Closely knit household-based relations among kin and local associations of friendship and ritual coparenthood (compadrazgo) form the principal social ties of everyday life. (The extensive translocal kinship ties that characterize those sectors of Latin America where indigenous societies and languages have survived are not found in the Caribbean Hispanic.)

By virtue of the comparatively recent arrival of Caribbean Hispanics, their adaptation to the United States is distinctive from that of Mexican Americans. Most Mexican Americans have experienced at least several generations as residents in the United States. However, the majority of Cuban and Dominican migrants began to arrive only in the 1960s, and Puerto Ricans did not start to arrive in substantial numbers until after World War II. As a result, a large percentage of Caribbean migrants are not fluent in English, are often less acculturated than Mexican Americans, and apart from the workplace, have less interaction with non-Hispanic society.

According to the 1980 census, there are approximately 2 million people of Puerto Rican descent in the United States (U.S. Bureau of the Census 1985), about 550,000 persons of Dominican origin (Kayal 1978; Gordon 1985) and slightly over 800,000 people of Cuban origin. Since many Dominicans are illegal aliens, most official census figures for Dominicans suffer from substantial underreporting. Approximately 50 percent of the Puerto Rican population and 85 percent of the Dominican population live in the New York metropolitan area; 59 percent of the Cubans live in Florida, mostly in the Miami-Dade County area (U.S. Bureau of the Census 1985).

Substantial sociodemographic differences exist among Caribbean Hispanic groups. Approximately 42 percent of Puerto Rican families live below the poverty level, compared with 14 percent of Cuban families. In 1981, the median family income was $11,300 for Puerto Ricans and $18,000 for Cubans. In contrast, the national non-Hispanic median family income was $22,800 (U.S. Bureau of the Census 1985).

The employment picture is similarly unfavorable for Puerto Ricans. In 1981, the unemployment rate among Puerto Ricans was 17.4 percent compared with 10.7 percent for Cubans and 9.5 percent for non-Hispanics. Only 8.5 percent of Puerto Ricans held professional, technical, and similar jobs compared with 17.7 percent of non-Hispanics (U.S. Bureau of the Census 1985).

Ethnographic research reveals that the migratory experience of Dominicans, like that of Cubans, is characterized by a continuing trend of upward mobility and a strong ethic of progress (Hendricks 1974; Gonzales 1971; Gordon 1978). However, census data indicate that the unemployment rate, median family income, and level of educational attainment are quite similar for Puerto Ricans and Dominicans. This disagreement between ethnographic research and census statistics may be the result of a bimodal distribution among Puerto Ricans. A large percentage (34 percent) of Puerto Rican males are not in the labor force in contrast to 16.2 percent of Dominican men, with the latter figure possibly as low as 7.4 percent according to Gurak and Kritz (1985). Although the large number of Puerto Rican males not in the labor force is not reflected in the unemployment statistics, their influence may be statistically reflected in the lowered median income and educational rates for all Puerto Ricans. It is also worthwhile to consider whether this group of Puerto Ricans constitutes the alcohol abusers who subsequently will be discussed.

Data Sources

Although epidemiological knowledge of Hispanics is disparate in substance, approach, and methods, the weight of evidence from a variety of sources makes it possible to identify some clear trends in the alcohol use of Caribbean Hispanics. Table 1 summarizes the major studies that review Caribbean Hispanic drinking.

The largest amount of information is for Puerto Ricans. The data are drawn primarily from the New York City metropolitan area and, to a lesser degree, from studies of small populations in other locales: "Newtown" (a pseudonym for a small New England city), New Haven, a Hawaiian plantation, and a small rural Pennsylvania town. Chicago and other industrial cities of the Midwest with substantial Puerto Rican populations are not represented.

Data for Cubans are drawn exclusively from the Miami-Dade County area of Florida. Other locales with sizable Cuban populations, such as New Jersey and New Orleans, are not represented. Dominican drinking data come exclusively from Newtown. Although the scope of studies may put us at a disadvantage in drawing conclusions, the richness of data from the local level case studies does provide an advantage for exploring the variable influences of the community environment on alcohol use.

This paper aims to establish some general strategies for analyzing data on Caribbean Hispanic drinking. These strategies have been contemplated with a view toward analyzing two particularly rich sources of data: the Hispanic Health and Nutrition Examination Survey (Hispanic HANES) (National Center for Health Statistics 1985) and the National Survey of black and Hispanic drinking conducted by the Alcohol Research Group in San Francisco (Caetano 1983). Suggestions also will be made about epidemiological approaches that may apply to studies of a wide variety of social and cultural groups.

As a word of caution to the reader, it should be noted that at times it has been impossible to determine whether a group described as Hispanic is from the Caribbean. In New York State and in the Northeast generally, most Hispanics are from the Caribbean or are descendants of Caribbean Hispanics. Here they are categorized as such.

What Kind of Drinkers Are Caribbean Hispanics?

Puerto Rican Alcohol Abuse

The literature on Caribbean Hispanic drinking is dominated by studies of Puerto Ricans. These

Table 1.—Review of key studies of Caribbean Hispanic drinking

Study focus and citation	Populations and approximate sample size	Site and date of study	Method
Hispanic Health and Nutrition Survey—Quantity and frequency of alcohol use with relevant socioeconomic and clinical variables (NCHS 1985).	2,847 Puerto Ricans 1,420 Cubans	New York metropolitan area; Dade County, FL (1982–1984)	Interview
Alcohol Research Group study of Cuban and Puerto Rican drinking (Caetano 1985).	219 Puerto Ricans 95 Cubans	New York City; Yonkers, NY; and Dade County, FL (1984)	Interview
Drinking patterns and problems in a Hawaiian plantation (Lemert 1964).	27 Puerto Ricans 116 Japanese 111 Filipinos 39 Portugese 34 whites	Hawaii (1959–1960)	Ethnography and interviews
Household survey of drinking and drinking-related problems (Haberman and Sheinberg 1967; Haberman 1970).	191 Puerto Ricans 105 blacks 103 Irish 70 other Catholic 49 other Protestant 37 Jewish	New York City (1963)	Interview
Study of drinking among rural farm workers (Kessler et al. 1977).	7,850 Puerto Ricans	Chester, PA (1974)	Focused interviews of key informants and ethnography
Study of socioeconomic adaptation and drinking in the Hispanic population of a New England city (Gordon 1978, 1979, 1981, 1985).	7,100 Dominicans 3,000 Puerto Ricans	Newtown, in New England (a pseudonym) (1977–1979)	Ethnography and interviews

Table 1.—Review of key studies of Caribbean Hispanic drinking—Continued

Study focus and citation	Populations and approximate sample size	Site and date of study	Method
Drug use and socioeconomic status (Phin and Phillins 1982).	138 Puerto Ricans 361 whites 268 blacks 205 American Indians 137 Mexican Americans 133 Asian Americans	New York City; Los Angeles; Denver; Seattle; Minneapolis-St. Paul (1976)	Interview
Drinking habits of outpatients (Fernandez Pol 1986).	132 Puerto Ricans 183 blacks	New York City (1982)	Interview and case records
Drinking habits of outpatients (Kane 1981).	99 Puerto Ricans 272 blacks	New York City (1973–1975)	Interview and case records
Polydrug and prescription drug abuse among women (Page et al. 1985).	132 Cuban females 72 males	Dade County, FL (1978–1983)	Ethnography and interviews
Drug and alcohol consumption among high school students (Kandel et al. 1976).	514 Hispanics 6,123 whites 782 blacks 63 Orientals 48 American Indians	New York City (1971)	Interview
Health behaviors of adolescents (Brunswick 1975).	51 Hispanics 39 whites 32 blacks	New York City (1967)	Interview
Drinking and parental influence on adolescent drinking (Singer 1985).	36 Puerto Rican girls 16 Puerto Rican boys	Hartford, CT (1985)	Interview
Alcohol use among students in grades 7–12 (Barnes 1984).	27,333 students	New York State (1983)	Questionnaire
Alcohol use and delinquency among adolescent offenders (Dawkins and Dawkins 1983).	34 Hispanics 174 blacks 115 whites	A northeastern State (1979)	Questionnaire

studies reveal high rates of heavy drinking among Puerto Rican men and moderation and abstinence among Puerto Rican women. Incidence of liver cirrhosis provides clear evidence of heavy alcohol use among Puerto Ricans. In New York City during 1979-1981, cirrhosis was the second leading cause of death among men 15-44 years of age who were born in Puerto Rico (New York City Department of Health, undated). Another study found that between 1960 and 1971, cirrhosis was the third ranking cause of death among Puerto Ricans in New York City but was the fifth ranking cause for the general population in the city (Alers 1982).

One of the first studies of adult Puerto Rican drinking outside New York describes a pervasive drinking problem. Conducted on a Hawaiian plantation, the study compares the drinking of Puerto Ricans with that of Portuguese, Hawaiians, Japanese, Filipinos, and Caucasians (Lemert 1964). Of the six groups studied, the Puerto Rican group was in the middle of the range for number of drinkers, but their drinking practices were far more striking. Puerto Ricans had two and three times as many weekend drinkers as the other groups except Filipinos. Puerto Ricans were treated by plantation physicians for alcoholism far more frequently than would be expected from their number. In addition, this group had greater involvement with the public welfare and criminal justice systems. The study maintains that the problems can be explained by the continuing and unremitting traditions of this Puerto Rican settlement, whose founders were beggars, prostitutes, and criminals who left Puerto Rico after the destructive hurricanes in the early twentieth century.

Haberman's (1970) examination of data from a 1963 study of Puerto Rican drinkers in New York City's Washington Heights section was the first research to highlight the substantial difference between male and female Hispanic drinking. Seventy-four percent of the women stated that they do not drink, compared with only 16 percent of the men. This represented a ratio of 4.6 male drinkers to 1 female drinker, a ratio far higher than that for all other New York City ethnic groups in the study–blacks, Irish, Italians, Jews, other Catholics, and other Protestants.

Haberman and Scheinberg (1967) also examined data on drinking among Puerto Ricans in New York City. Their analysis revealed that 21 percent of the Puerto Ricans had serious alcohol-related problems and exhibited what the authors described as high rates of "implicative drinking," wherein problems generally associated with drinking, such as a poor work record, were evident.

Another study was carried out in 1974 in a rural Pennsylvania Puerto Rican community of 7,800 (Kessler et al. 1977). Sixty-five percent of the resident adult male Puerto Ricans reported drinking on a daily basis compared with 12 percent of the general population. Furthermore, 30 percent of the Puerto Rican men experienced problems related to their drinking. It is difficult to affirm the validity of this report because neither the sample size nor method of sampling were specified. Nevertheless, the study was important because it examined the relationship between the social and economic context of drinking, on the one hand, and rates of alcohol abuse or alcoholism, on the other.

From these data, it was ascertained that the typical Puerto Rican drinker is "... nearly always male, non-English-speaking, unemployed, often living alone and facing criminal charges related to his drinking . . ." (Kessler et al. 1977, p. 63). Furthermore, the Puerto Rican population was "burdened by extreme physical isolation and the forced and destructive dependence on the local mushroom farm owners and supervisors" upon whom most of the Puerto Ricans in the area were economically dependent. The authors also noted that "... deviant behavior, such as excessive alcohol abuse, is not checked by internal community sanctions, but by external forces, such as law enforcement or the mushroom farmer," whose restraints have little positive effect (Kessler et al. 1977, p. 63).

This author's own investigation of Puerto Rican drinking behavior (Gordon 1979, 1981, 1985) in a small New England city from 1977 to 1979 found that Puerto Rican males had a 10 percent prevalence of heavy alcohol use that was exacerbated by the additional use of inhalants, barbiturates, and cocaine. For the most part, these were younger men whose alcohol and drug use constituted only part of a more problematic picture that included welfare dependency, loss of legitimate family roles, unemployment, recurring family conflict, and violence when drinking.

The tendency among Puerto Ricans to use alcohol along with other drugs is also recognized in a multi-ethnic study of drug users in five major American cities in 1977. Puerto Rican drug users consumed more alcohol than did other drug users (i.e., blacks, whites, Mexican Americans, American Indians, and Asian Americans), and they did so at a younger age (Phin and Phillips 1982).

The severity of alcohol problems among Puerto Ricans is also reflected in two studies comparing Puerto

Ricans and blacks in treatment for alcoholism (Kane 1981; Pol et al. 1986). Both studies found that Puerto Ricans exhibited more dramatic symptomatology. Kane stressed the inclination of Puerto Ricans to have hallucinatory experiences, and Pol and colleagues reported a great number of somatic complaints in the Puerto Rican group. Kane cautions against deducing that Puerto Ricans are "vision-prone." Alternatively, he suggests that the severity of the symptomatology may be due to higher rates of drinking or to waiting longer before seeking treatment. Given that Pol and colleagues found that the Puerto Rican clinical population had a higher proportion of daily drinkers than blacks, it may be that acute symptomatology reflects more advanced and severe alcoholism.

Comparison of Drinking Patterns of Cubans and Dominicans With Puerto Rican Drinking Patterns

Caetano (1983) has studied drinking patterns and alcohol-related problems in a national sample of Hispanic Americans. His research replicates a finding of characteristic heavy drinking among Puerto Ricans. Sixteen percent of the Puerto Ricans in his sample were frequent heavy drinkers, consuming five or more drinks at a sitting once a week or more often. Only 5 percent of the Cubans were in this category. Moreover, since Caetano was unable to locate preselected Puerto Rican male subjects for an interview (Caetano, personal communication), the figures for heavy drinkers among Puerto Ricans may be much higher. Men with drinking problems generally are among the more difficult subjects for researchers to locate.

Moreover, Miami-based researchers have noted that migrant Cubans in Miami are not known for excessive drinking, but rather exhibit self-control and behavioral restraint toward alcohol use (Paige et al. 1985). Data on 132 Cuban women who participated in a study of prescription drug users also show that among older Cuban women, only 26 percent used alcohol. Of the remaining study subjects, nearly all drank no more often than once a month. Generally, for Cubans, Puerto Ricans, and Dominicans, female drinking is not discussed, and there are no reports of drinking problems apart from isolated instances.

Ethnographic work on Dominicans in Newtown (Gordon 1978, 1979, 1981, 1985) describes the changes in traditional drinking that coincide with migration and resettlement. Dominicans increasingly confine their drinking to weekends. They temper a traditional style of binge drinking by limiting consumption to social occasions, mostly on Saturday nights rather than over long weekends. Many prefer to focus energy, time, and money on investments for the future and on obligations to family and household. This trend toward moderation coincides with enhanced economic opportunities. From their point of view, better earnings and moderation in alcohol use are the benefits of their commitment to a new male ideal of being a responsible father and husband; and the ideals themselves inspire continuing upward mobility and less frequent drinking.

Comparative Moderation Among Puerto Rican Youth

If Puerto Rican men are indeed heavy drinkers, more so than other Hispanics and non-Hispanics, an obvious question concerns the age at which drinking is initiated. A study of New York State youth revealed that young Hispanic youth, mostly Puerto Ricans, had lower rates of experimental use of alcohol than all other racial/ethnic groups with the exception of Orientals. American Indians had the highest percentage of youth who had ever used liquor (74 percent), followed by whites (68 percent), blacks (59 percent), Hispanics (50 percent), and Orientals (18 percent). For ever having used beer or wine, the rates were 96 percent for American Indians, followed by whites (84 percent), blacks (77 percent), Hispanics (65 percent), and Oriental youth (53 percent) (Kandel et al. 1976).

A study conducted in 1967, employing a considerably smaller sample and the much smaller geographical area of New York City's Washington Heights, reported that young Puerto Ricans, unlike white and black groups, did not have drinking problems (Brunswick 1969). The study further reported that Hispanic adolescent girls had an abstemious pattern similar to that of adult women, whereby 50 percent never drank beer and 80 percent never drank hard liquor. This rate of drinking is quite similar to the preliminary results of a more recent project conducted among Hispanic adolescents in Hartford, Connecticut (Singer 1985), in which 59 percent of the Hispanic female youth had never consumed alcohol.

In a recent survey of 27,333 junior high and high school students in New York State, the rate of heavy drinking among white male students was 21 percent, while the rate was 12 percent among Hispanic male students and 8 percent among black male students. Heavy drinking among white females was 11 percent, compared with 4 percent among Hispanics and 2 percent among blacks. Heavy drinking was defined as drinking at least one time each week with large amounts of alcohol (5 to 12 drinks) consumed at each episode (Barnes 1984). Again, the pattern demonstrates substantial sex differences and a rate for Hispanics that is relatively low.

A widely accepted popular belief that Hispanic drinking is characterized by macho, aggressive behavior (more so than in other ethnic groups) is no more borne out by available information on boys than it is among men (Gordon 1985). One indicator of these behaviors is found in the incidence of violent crime when alcohol has been used. A study conducted in a residential juvenile training home in a northeastern State examined the relation between Hispanics and violent crime (Dawkins and Dawkins 1983). Examination of the records of 342 residents demonstrated that alcohol use was not a factor implicated in criminal offenses of Hispanics, while this was very much the case for blacks and whites. Furthermore, the Hispanic group was far less inclined to be involved in serious offenses involving victim-related crimes.

Factors in Moderation and Alcohol Abuse

Insufficient attention in research has been paid to the factors that lead to alcohol abuse and alcoholism, and equally little attention has been given to the factors that lead to moderation. When attempts have been made to offer some explanation for drinking patterns, the tendency too often has been to interpret the epidemiological data within well-worn cliches about Hispanic culture.

Gender-Specific Assumptions About Hispanic Culture

Explaining the extremes of drinking represented by males and females is one such example of interpreting data to conform to readily accepted beliefs. Much of the literature claims a relation between excessive drinking and machismo, i.e., displays of strength, aggression, and prowess with women (for Caribbean Hispanics, see Abad and Suarez 1975; Caste and Blodgett 1979; and Panitz et al. 1984; for other Hispanics, see Gordon 1985). Yet in its original sense, machismo refers to honor and self-respect and living up to one's traditional obligations as a father and provider for the family. Whereas displays of male domination and power are not absent in Hispanic culture (nor in most cultures, for that matter), there is no evidence that this complex of male behavior is any more tied to drinking among Hispanics than it is among any other ethnic group.

Clearly, the data indicate a minimum of drinking-related problems among Hispanic women. The literature describes female drinking behavior as if there is an inevitable conformity to fulfill sex role stereotypes. A search for factors apart from those associated with adherence to traditional images of female behavior seems an increasingly important task, especially because the patterns of female drinking are now showing definite signs of change. A regard for order in the family unit, an unwillingness to squander money in fleeting indulgences, and a need to stay mentally aware and competent are some alternative hypotheses that may explain moderation in women as well as in men.

Assumptions About Acculturation

Another approach has been to explain variability in Hispanic drinking in light of the influence of American culture, or that acculturation is responsible for increases in drinking among migrants and their successor generations. This sort of reasoning does not work very well in the case of Caribbean Hispanics. Acculturation among Puerto Ricans, Dominicans, and Cubans began long before Caribbean Hispanics reached the United States. Furthermore, it is not necessarily acculturation that accounts for increases in drinking. Increases in drinking may be attributed to the deterioration of social institutions that had once functioned to constrain and ameliorate deviant drinking behavior.

Proposed Research Emphases

To understand fully the salient causes of increased drinking, it is preferable to rely on explanations that effectively mirror what is transpiring in situ. This author argues for a fresh view of the social or cultural environment to examine how social, economic, and cultural variables in that environment differentially affect drinkers, nondrinkers, alcohol abusers, unremitting alcohol abusers, and those who appear to "spontaneously" remit from alcohol dependence. For example, recent studies of Cuban drinking (Paige et al. 1985) and Dominican drinking (Gordon 1978, 1981, 1985) conscientiously avoid the tendency to explain drinking styles by referring to automatic adherence to cultural rules. Rather, drinking behavior is explained from the standpoint of a dynamic interaction between people and the environment in which they live–all adapting, making a living, and fashioning norms and ideals of drinking behaviors that may be quite traditional but may also be a significant departure from tradition.

Several research strategies emerge from approaches that have been tried already. The list that follows, though not exhaustive, seems potentially productive in terms of future research. These proposed research emphases are divided into the influences of the household, the street culture, and local institutions.

The Household

Examining influences of the household appears to be a fruitful line of inquiry to explain maintenance or, conversely, deterioration of traditional drinking styles. A study of Cuban drug use in Miami (Paige et al. 1985) carefully weighed the influences of the household on youth. The study observed that youth are indeed influenced by an "American pattern" of relatively heavy teenage drug and alcohol abuse. However, the household plays a vital role in transmitting traditional Cuban values of maintaining control and respect for self-restraint, thereby depressing influences of the "American pattern."

When Cuban youths regularly use alcohol and drugs, it is frequently the result of a home background that has deteriorated due to the immigrant experience. The Paige study further found that youth who lacked supervision and an intact family structure were those who came under the influence of older boys who promoted drug and alcohol use (Paige et al. 1985). Szapocznik and others at the Spanish Family Guidance Clinic in Miami, drawing on a wide range of clinical experiences with Cuban youth, also reported a direct correlation between a disorganized family background and drug and alcohol use (Szapocznik et al. 1977, 1979).

Street Culture

To explain the formation of alcohol and drug use among youth, some researchers stress the social world of youth in city streets. A study of Hispanic, black, and white junior high school students in New York City assessed the roles of the street arena–the social relations, the leisure time, and the use of alcohol and drugs (Dembo et al. 1979). The investigators summarized their conclusions as follows:

> Basic to the thrust of our argument is the recognition that we must cease regarding drug use as reflecting primarily personality and interpersonal problems. A given drug-involved student may, indeed, experience difficulties in these areas. However, drug taking must be viewed as an environmentally related phenomenon that serves to define a personal and social self in a particular social and cultural setting.
>
> (pp. 246-247)

Local Institutions

A knowledge of the spectrum of local institutions, such as social clubs and churches, and their associated norms and values can provide a third line of attack for understanding drinking patterns. Singer (1984) and Singer and Borrero (1984) have studied the influence of religious institutions on drinking. Elsewhere in New England, Gordon (1981) examined Pentacostalism and Charismatic Catholicism and found that these religious institutions provided therapy for people suffering from drinking-related problems and promoted a community-wide influence that encouraged people to temper their drinking.

A General Orientation for an Epidemiology of Alcohol Use and Abuse

Part I–Methodological Problems

Indicator Data

Epidemiological studies of alcohol use have involved an aggressive search to measure the problem. Often this has meant relying on indications of drinking-related problems, a reliance that can result in overestimation and miscomprehension. Indicators may indeed have some material relation to alcohol abuse; however, it is sometimes unclear whether the indicator is a result or a cause of problem drinking. If cause is thus confused with consequence, a disservice is done to the goal of understanding the genesis of drinking-related problems. It is also possible that the indicator is present but the drinking is not.

To illustrate, the study by Haberman and Scheinberg (1967) is one of the influential papers that continue to shape our ideas about heavy Puerto Rican drinking. Also, it is one of the earlier efforts to use indicator data to define the scope and severity of alcohol-related problems among Caribbean Hispanics. This study examined problems related to health, job, and money, together with family arguments due to drinking. An affirmative answer for the existence of these problems implied that one was an alcohol abuser or an alcoholic.[1] However, the study did not consider that increased drinking might accrue from a problem: Culturally acceptable uses of alcohol are not uncommon when one is beset with frustrations of living, and alcohol can serve as a palliative to those frustrations. If the questions in the surveys had been reversed–if people had been asked if they drank due to problems with health, job, money, or family arguments–then there might have been the same number of affirmative answers, perhaps even more. Consequently, our conception of the role of alcohol in the lives of the subjects might be very different.

It is also likely that if all people in a given survey were asked if they had problems with their health, with a job, or with money, many would answer in the affirmative whether or not they drank to excess. In such cases, drinking behavior may well be independent of the ambient problems of a group. Drawing the arrows of causality from alcohol to social and economic problems in an interview situation may not accurately reflect the social reality of the drinker. The definition of drinking styles through an assessment of problems is not solely the province of earlier studies. Caetano's (1983) recent examination of social problems among Hispanics and blacks adopts a similar strategy of analysis.

Treatment Data

Treatment data have been another source for assessing the magnitude of alcohol problems among Hispanics. However, there is immense variability in the participation of Hispanics in alcohol treatment at different times and places. In 1975, data from the National Institute of Mental Health revealed that Hispanics had the lowest alcohol-related admission rates of any ethnic group in the United States (Caste and Blodgett 1979). Yet in the 1980s, treatment of Hispanics has increased substantially in some places. A 1983 national study reported that 13 percent of those in treatment in the State of New York were Hispanic, although Hispanics accounted for only 9 percent of the population. However, that same year in Florida, only 5 percent of the treatment population was Hispanic, although Hispanics constituted 9 percent of Florida's population (NIAAA 1983). What treatment data may reflect, then, is the accessibility to treatment of one ethnic group versus another.

One should be cautioned when assessing the number of alcoholics in treatment by means of treatment utilization statistics. The National Drug and Alcohol Abuse Treatment Utilization Survey (NDATUS), the major source of data on alcohol treatment, does not effectively distinguish between those in treatment because of alcoholism or alcohol abuse and those participating because of drug abuse or addiction (NDATUS 1983).

Driving Under the Influence

Using drunk driving arrest statistics as an indicator of the prevalence of alcoholism or alcohol abuse is a strategy fraught with problems for Caribbean Hispanics, as it is for some other populations in this country. As is discussed by Caetano (1983) and Alcocer (1982), drunk driving rates are often a function of the levels of surveillance in Hispanic neighborhoods and the rigor with which enforcement takes place.

Moreover, drunk driving arrest statistics for Hispanics are subject to alternative interpretation. In a study in New Haven (Abad and Suarez 1975), evidence suggested that drinking among Puerto Ricans was not severe. In fact, the arrest rate for intoxication among the Puerto Rican population was about one-half the overall rate for the city. Yet the authors asserted that the low arrest rate for Puerto Ricans was evidence of the presence of a drinking problem, not of its absence. They contended that the low rate was a result of the Hispanic family's sense of shame about the alcoholic and its vigilance in keeping the drinker in the house, off the road, and out of the public eye.

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[1] Haberman and Sheinberg (1967) used the term "implicative drinker" to describe those who possess social, economic, or job problems as a result of drinking. Subsequently, Haberman and Baden (1974) used the term "alcoholic" to describe people who drink and who reportedly have these same problems. To be more inclusive, the terms alcoholic and alcohol abuser have been used in this paper as a substitute for the term implicative drinker.

A General Orientation for an Epidemiology of Alcohol Use and Abuse

Part II–Alternative Model

The tendency in studying the epidemiology of alcohol use is to emulate the approaches of chronic disease epidemiology, that is, to follow a strategy of examining mostly continuous variables, then reviewing them in light of clinical data, and, finally, deducing risk factors. In cardiovascular disease, scientists inquire about degrees of smoking, obesity, and age and correlate these variables with clinical data. In the epidemiology of alcohol use we examine variables such as age, educational level, the number of years of residence in the country, the generation of the migrant group and match these variables with quantity-frequency data, our "clinical" data.

Alternatively, the model of infectious disease epidemiology offers an approach to drinking that involves direct examination of the environmental context in which drinking takes place and an effort to understand the material relation between factors in the environment on the one hand and the quantity, frequency, and style of drinking on the other. Epidemiologic data from the Hispanic HANES and the Alcohol Research Group's survey (Caetano 1983) will not only extend our knowledge of macrosociological features of drinking, but also will nourish research that is fashioned after the model of infectious disease epidemiology. Survey data may raise questions and generate hypotheses about potentially interesting variables. In infectious disease epidemiology, these variables are classified as agents of transmission, environmental preconditions, and protective factors. The same analytic distinctions can guide our data collection in community alcohol research that uses ethnographic and intensive interview methods.

Identification of agents of transmission (e.g., people, social institutions, and ideas) would focus on the socio-environmental influences that variably affect youth and adults. These influences might include ease of access and positive regard for alcohol in different settings, such as in one's family, contexts of socializing, and fiestas, and through the media and other means of transmitting cultural norms and information about availability.

Examination of environmental preconditions would focus on the factors facilitating transmission of drinking patterns across generations and over space. The emphasis would be on conditions that lead people to spend time and money on alcohol use. Examples of these conditions might include pessimism about the chances to improve one's life, reluctance to plan beyond a day, or reluctance to conserve time and resources for the future, as may happen with the chronically out-of-work Puerto Rican.

Factors protecting people from deviant or morbid patterns of alcohol use would include religion, health education, and acceptable strategies for allocating time and money to the future as opposed to the immediate gratification conferred by alcohol. The focus here would be on cultural restraints on drinking that appear to affect women, youth, and, no doubt, many adult men.

These comments favoring the infectious disease model of research recast this author's thoughts about the need for community studies, a theme raised several times in this paper. The challenges of bridging the gap between epidemiological and survey research, on the one hand, and community research, on the other, have been daunting in all public health fields; alcohol research is no exception. Until recently, many people working in the ethnographic and community study tradition have failed to quantify data and thus have made findings at the local level incongruous and out of place with survey data. Those working with survey data have failed to adopt measurable variables developed from qualitative community study. The papers in this monograph indicate an emerging collaboration of effective and sensible research approaches for understanding alcohol use and the development of research standards that will markedly benefit the study of Caribbean Hispanic drinking.

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Drinking Patterns and Alcohol Problems in a National Sample of U.S. Hispanics

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ABSTRACT

This paper describes drinking patterns and alcohol problems among U.S. Hispanics. The sample is composed of 1,453 individuals selected randomly from the Hispanic population in the United States and, as such, constitutes a representative sample of the national household population of this ethnic group. Data were collected through face-to-face interviews conducted at the respondents' homes. Results show that men drink more than women and that, for both sexes, drinking is positively associated with income and education. Quantity and frequency of drinking also change with age. Among men, frequent heavy drinking, with the prevalence of four or more related problems, does not decline from their twenties through their thirties, as might be expected based on previous results with samples of the U.S. general population. Mexican Americans drink more than other national groups and also report more drinking-related problems. Findings by birthplace show that first-generation men and women born in the United States drink more than other individuals in the sample but dos not report more problems. This paper discusses the implications of these findings for understanding issues related to alcohol use and drinking-related problems and their relationship with sociodemographic variables and acculturation among Hispanics.

Introduction

Until 1979, most of the information about Hispanic drinking patterns and associated problems came from research in which Hispanics were not the focus of study but rather were interviewed as part of larger samples. Alcocer's (1979) study of Hispanic drinking in three California locales and Maril and Zavaleta's (1979) study of lower class Mexican American women in Brownsville, Texas, until recently were the only large-scale general population studies focused on drinking among Hispanics. As recent reviews have pointed out (Caetano 1983, 1984*d*), results from this literature have limited application either because the number of respondents was small or because the samples were representative only of small communities in the American Southwest.

Still, the findings from the various studies have been fairly consistent: compared with other ethnic groups in the United States, Hispanics are among those with higher rates of heavy drinking and alcohol-related problems. Contradicting this finding are the results from two surveys (Cahalan and Room 1974; Cahalan and Treiman 1976) of drinking practices in San Francisco. This contradiction may derive from the presence among San Francisco's Hispanic population of a large number of Central Americans, a group thought to drink less than other Hispanic groups.

Since 1979, increased attention has been given to drinking and alcohol-related problems among U.S. Hispanics. This upsurge in interest is suggested not only by an increase in the number and methodological rigor of recent publications, but also by an increase in other research-oriented activities.

An analysis of a sample of San Francisco Bay area Hispanics of primarily Mexican ancestry is part of this increasing interest in the patterns of alcohol use and drinking problems among Hispanics (Caetano 1984*a*,*b*,*c*). Results from that research confirmed previous findings and provided new and intriguing clues to patterns of alcohol use among members of this ethnic group . Abstention was found to be high among females (32 percent) and low among males (14 percent). A quarter of the males were frequent heavier drinkers. Among males, drinking was positively associated with being young and separated or divorced. Among females, drinking was positively associated with being young, more educated, and single, separated, or divorced. About 35 percent of the respondents reported one or more alcohol-related problems. Compared with blacks and non-Hispanic whites in the same sample, Hispanics not only had more problems but also had a different pattern of drinking and of problem distribution by age. Among whites, problem prevalence decreased with age, with an especially abrupt decline from the twenties to the thirties. Among Hispanics and blacks, however, the reverse was true. Problem prevalance increased from the twenties through the thirties and then decreased in older age groups. Finally, Hispanics also demonstrated more liberal attitudes toward drinking and drunkenness than did whites and blacks.

The research on Hispanics in the San Francisco Bay area analyzed the responses of 634 individuals, a number larger than that used in previous studies. However, because this number was achieved by grouping a series of probability samples, the final group of respondents could not be said to be representative of any one population. Also, because 80 percent of the respondents identified themselves as Mexican Americans, generalizations about other Hispanic groups could not be drawn from the sample. This study was developed and conducted in part to test and elaborate the findings of the San Francisco Bay area study on a national sample representative of all Hispanic populations in the coterminous United States. This paper presents some initial findings from this survey of drinking practices and problems among Hispanics.

Method

Sampling Methodology

Respondents in this study represent a multistage probability sample of Hispanic households in the 48 coterminous United States. The sampling methodology has been described in detail elsewhere (Santos 1985). In brief, the first stage of selection designated a total of 110 primary sampling units composed of metropolitan counties of Standard Consolidated Areas or Standard Metropolitan Statistical Areas and nonmetropolitan counties. About 66 percent of the U.S. Hispanic population lives in these 110 units. At the next selection stage, secondary sampling units were formed from block groups and enumeration districts. Hispanic secondary sampling units–those with a population that was 15 percent or more of Spanish origin according to 1980 census data–were oversampled by a factor of eight. Thus, respondents living in areas with large Spanish-origin populations were systematically overrepresented in the sample, an imbalance that was corrected by weighting. Within each secondary sampling unit, a single tertiary unit was selected as the listing area. Enumerators were sent to each listing area to update the housing lists before sample selection. At the final stage of selection, households were sampled from listing sheets and assigned to interviewers. The designated respondent in each household was randomly chosen from household members aged 18 years and older who fell into the sampling frame.

The national Hispanic sample was drawn and interviewed in conjunction with samples of the black population and of the general U.S. adult population. Altogether, 1,453 respondents were interviewed in the Hispanic sample, 1,947 in the (non-Hispanic) black sample, and 1,821 in the sample of the remainder of the U.S. population. With appropriate weighting, the three samples constitute a sample of the entire U.S. adult population. The response rate for the Hispanic sample was 72 percent.

Data Collection

Data were collected by trained interviewers in the respondents' homes in face-to-face interviews that averaged 1 hour in length. The instrument for data collection was a standardized questionnaire, administered by bilingual interviewers as needed. About 43 percent of the respondents in the Hispanic sample chose to be interviewed in Spanish.

Ethnic Identification

The main ethnic identifier for sample selection and analysis was "ethnicity of the family of origin." The respondents were asked, "Which of these groups describes your family origin?" Of seven categories that were provided, two were Hispanic: black of Hispanic origin (Latino, Mexican, Central or South American, or any other Hispanic origin) and white of Hispanic origin (Latino, Mexican, Central or South American, or any other Spanish origin). If either of the two Hispanic categories was selected, the respondent was then asked, "Which of these groups best describes your own ethnic identification: Puerto Rican, Cuban, Cuban American, Mexican, Mexican American, Latin American (specify country), other Spanish-Hispanic (specify country), Anglo American, or some other group (specify)?" About 95 percent of those who were identified as Hispanics by the first question were so identified by the second as well.

Quantity-Frequency Index

The quantity-frequency index used in this report is based on that proposed by Cahalan and colleagues (1974). The information used to calculate this index is the respondent's self-reported frequency of drinking any alcoholic beverage, including wine, beer, and liquor, and quantity of consumption of wine, beer, and liquor during the 12 months prior to the survey. The respondent's frequency of drinking was coded in 11 categories, ranging from "never" to "three or more times a day." Quantity of consumption was elicited by asking the proportion of drinking occasions during which the respondent drank five or six, three or four, and one or two glasses each of wine, beer, and liquor. Based on the information on frequency of drinking a specific beverage together with the frequency of drinking specific amounts of that beverage, respondents were classified according to whether they drink five or more drinks of any beverage at least once a week, at least once a year, or never (see Room 1985 for a detailed description). Cross-tabulating these categories with the frequency of drinking any alcoholic beverage provided a quantity-frequency index suitable for data analysis. The index is composed of seven categories defined as follows:

Frequent heavy drinker: Drinks five or more drinks at a sitting once a week or more often. A drink is defined as 1 ounce of spirits, 4 ounces of table wine, or 12 ounces of beer, each of which contains approximately 9 grams of absolute alcohol.

Frequent high maximum: Drinks once a week or more often and occasionally (at least once a year) has five or more drinks at a sitting.

Frequent low maximum: Drinks once a week or more often but never consumes five or more drinks at a sitting.

Less frequent high maximum: Drinks one to three times a month and has five or more drinks occasionally (at least once a year).

Less frequent low maximum: Drinks one to three times a month but never has five or more drinks at a sitting.

Infrequent: Drinks less often than once a month but at least once a year; may or may not drink five drinks at a sitting.

Abstainer: Drinks less frequently than once a year or has never drunk alcoholic beverages.

Results

Drinking Patterns by Sex and Age

A striking difference was found between the drinking patterns of men and women in the sample (table 1). About half the women are abstainers, and another one-fifth are infrequent drinkers. In contrast, only one-fifth of the men are abstainers, and about two-thirds drink at least once a month. About one-fifth of the men are frequent heavy drinkers, and another one-fifth are frequent high maximum drinkers.

Respondents of both sexes drink beer more often than they drink either wine or liquor. About 40 percent of the men drink beer at least once a week, and 11 percent drink beer almost every day. Women drink less often: 8 percent drink beer at least once a week, and only 1 percent drink it daily. Wine is drunk at least once a week by 6 percent of the men and 3 percent of the women. Liquor is drunk even less frequently. About 5 percent of the men and 2 percent of the women report drinking liquor at least once a week. Eighteen percent of the men do not drink beer, compared with 46 percent who do not drink wine and 41 percent who consume no liquor. Among women, 55 percent do not drink beer, 56 percent do not drink wine, and 60 percent do not drink liquor.

Table 1.–Drinking patterns by age and sex, in percent

Sex/drinking pattern	Age group					
	18-29	30-39	40-49	50-59	60+	All
Males[a]						
Abstainer	22	17	23	24	30	22
Infrequent	10	5	13	7	21	10
Less frequent low maximum	9	5	30	39	19	15
Less frequent high maximum	5	13	7	3	4	7
Frequent low maximum	13	6	9	5	15	11
Frequent high maximum	24	28	6	3	8	19
Frequent heavy drinker	17	26	11	12	3	17
N	(204)	(169)	(90)	(63)	(78)	(604)
Females[b]						
Abstainer	40	45	41	47	78	47
Infrequent	35	23	19	7	10	24
Less frequent low maximum	6	18	5	11	5	9
Less frequent high maximum	6	5	17	3	0	7
Frequent low maximum	2	3	2	4	6	3
Frequent high maximum	8	4	14	20	0	9
Frequent heavy drinker	2	2	2	8	0	3
N	(282)	(231)	(129)	(87)	(116)	(845)

Note: Weighted percentages; unweighted sample Ns.

[a] X^2 males = 150.863; df = 24; $p < .001$.

[b] X^2 females, frequent high maximum and frequent heavy drinkers combined = 143.772; df = 20; $p < .001$.

When disaggregated by age (table 1), the data suggest that drinking decreases with age. Among men, abstention remains stable until the 50-59 age group and increases thereafter. The number of infrequent drinkers increases considerably in the 60-and-older age group, and the number of less frequent low maximum drinkers increases in the 40-49 and 50-59 age groups. Both frequent high maximum drinking and frequent heavy drinking increase from the twenties through the thirties and decrease thereafter. As with men, the proportion of women abstaining remains stable until age 50 through 59 and then increases substantially in the oldest age group. In general, a decrease occurs in all categories of drinking, but women in the 50 to 59 age group show an increase in both frequent high maximum and frequent heavy drinking. Together, these two categories represent the drinking patterns of about 30 percent of the women 50 through 59 years of age.

Drinking Patterns by Income and Sex

Classification according to family income produces a positive association between drinking and income (table 2). Although results for those in the highest income bracket must be interpreted cautiously due to small sample size, the proportion of abstainers and infrequent drinkers appears generally to decrease with increasing income. Together, the other categories of drinking do not show a clear association with income. Among women, there are three times more abstainers in the lowest income bracket than in the highest. The number of female infrequent drinkers and less frequent low maximum drinkers substantially increases as income increases. About one-fifth of the women in the $10,001-$15,000 category and in the highest income group (greater than $30,000) display drinking patterns sufficiently heavy to be classified as frequent high maximum.

When age is controlled for, abstention is positively associated with income among men 18 through 29 and 30 through 39 years of age. For older age groups, the abstention rate is higher in the lower income brackets. Among women, the decrease in abstention and the

Table 2.–Drinking patterns by income and sex, in percent

	Income					
Sex/drinking pattern	Up to $6,000	$6,001-$10,000	$10,001-$15,000	$15,001-$20,000	$20,001-$30,000	$30,000+
Males[a]						
Abstainer	24	19	18	13	43	4
Infrequent	29	8	12	10	5	1
Less frequent low maximum	5	7	18	29	14	18
Less frequent high maximum	5	7	11	18	4	1
Frequent low maximum	15	8	3	2	7	27
Frequent high maximum	12	36	23	14	10	18
Frequent heavy drinker	10	14	14	11	15	30
N	(117)	(134)	(120)	(72)	(82)	(50)
Females[b]						
Abstainer	67	58	49	44	29	22
Infrequent	12	19	12	25	37	38
Less frequent low maximum	7	4	6	13	14	14
Less frequent high maximum	6	12	4	8	7	1
Frequent low maximum	2	3	5	3	3	2
Frequent high maximum	2	2	23	4	5	20
Frequent heavy drinker	2	2	1	3	5	3
N	(232)	(190)	(136)	(96)	(85)	(58)

Note: Weighted percentages; unweighted sample Ns.

[a] X^2males = 237.537; df = 30; $p < .001$.

[b] X^2females, frequent high maximum and frequent heavy drinkers combined = 146.377; df = 25; $p < .001$.

increase in infrequent and less frequent low maximum drinkers are not an effect of age.

Drinking Patterns by Education and Sex

Drinking is also positively associated with an increase in education (table 3). For males, the rate of abstention is three times lower among those with some college education than among the lowest educational group. Most of the six drinking categories change little with education. However, there is a substantial increase in the proportion of frequent high maximum drinkers among those with high school education and of frequent heavy drinkers among those with some college education. Among women, the association between drinking and education is roughly J-shaped. The rate of abstention drops by half from the lower to the higher educational groups, but women with grammar school education drink the least of all groups. Both infrequent drinking and less frequent drinking increase substantially among women with some college education, but frequent high maximum drinking is high at both extremes of the education categories.

For neither men nor women is the high rate of abstention among those with lower levels of education an effect of age. However, the same cannot be said of other associations depicted in table 3. The rate of frequent heavy drinking (32 percent) among college-educated males is the result of drinking by men aged 18 through 29 years and 30 through 39 years. Among women, most of the infrequent drinking in the college-educated group, as well as the frequent high maximum drinking among those with high school educations, can be accounted for by women aged 18 through 29 and 30 through 39 years.

Drinking Patterns by Ethnic Self-Identification and Sex

Table 4 shows drinking patterns by gender for the larger subgroups of the U.S. Hispanic population,

Table 3.–Drinking patterns by education and sex, in percent

Sex/drinking pattern	Education Up to 8th grade	Grammar school	Some high school	High school	Some college
Males[a]					
Abstainer	32	47	14	19	11
Infrequent	11	4	15	7	10
Less frequent low maximum	2	6	18	14	27
Less frequent high maximum	10	3	7	10	5
Frequent low maximum	9	17	21	5	5
Frequent high maximum	19	10	12	33	12
Frequent heavy drinker	16	13	11	11	32
N	(150)	(58)	(120)	(154)	(121)
Females[b]					
Abstainer	59	73	54	39	26
Infrequent	22	12	5	33	33
Less frequent low maximum	5	6	5	7	18
Less frequent high maximum	2	3	23	5	2
Frequent low maximum	2	0	2	4	5
Frequent high maximum	10	2	3	9	13
Frequent heavy drinker	0	3	6	1	2
N	(209)	(102)	(170)	(217)	(147)

Note: Weighted percentages; unweighted sample Ns.

[a] χ^2males = 174.357; df = 24; $p < .001$.

[b] χ^2females, frequent high maximum and frequent heavy drinkers combined = 179.796; df = 20; $p < .001$.

identified in the national study as Mexican American, Cuban American, Puerto Rican, and "others." Mexican American men have a higher rate of abstention than other Hispanic men, but those who drink do so more heavily. About 44 percent of Mexican American men are either frequent high maximum or frequent heavy drinkers, compared with 24 percent of Puerto Rican men, 6 percent of Cuban American men, and 24 percent of men in the "other" category. Thus, whereas the predominant pattern of drinking among Mexican American men is that of heavier drinking, the pattern of Puerto Ricans, Cuban Americans, and men in the "others" category is of less frequent low maximum or frequent low maximum drinking. In addition to drinking more frequently, Mexican American men appear to consume larger quantities of alcohol per sitting. Mexican American women also seem to drink more than women in other Hispanic groups, as evidenced by the larger proportion of frequent high maximum drinkers among Mexican American women. Puerto Rican women have the lowest rate of abstention and the highest proportion in the less frequent high maximum group of drinkers (i.e., those who drink one to three times a month but never consume five or more drinks at a sitting).

Controlled for age, the associations between drinking pattern and ethnicity for the most part are unchanged. However, the increased rate of frequent high maximum drinking among Mexican American men is restricted to those in the 18-29 and 30-39 age groups.

Drinking Patterns by Birthplace and Sex

Respondents who were born in the United States were assigned to one of two categories: Those with one or both parents born in a Latin American country were grouped under the label "First generation," and all other U.S.-born respondents were grouped in the "others" category. As with previous tabulations, results for Puerto Ricans, Cubans, and Latin Americans should be viewed cautiously due to the small number of individuals in these groups.

Table 4.–Drinking patterns by ethnic self-identification and sex, in percent

Sex/drinking pattern	Ethnic group Mexican Americans	Puerto Ricans	Cuban Americans	Others
Males[a]				
Abstainer	27	19	12	9
Infrequent	8	4	31	12
Less frequent low maximum	4	41	38	21
Less frequent high maximum	10	4	2	2
Frequent low maximum	6	7	10	32
Frequent high maximum	26	8	1	9
Frequent heavy drinker	18	16	5	15
N	(410)	(78)	(45)	(66)
Females[b]				
Abstainer	46	33	42	69
Infrequent	23	29	31	14
Less frequent low maximum	10	6	11	6
Less frequent high maximum	4	19	4	5
Frequent low maximum	2	6	4	2
Frequent high maximum	12	3	7	1
Frequent heavy drinker	2	2	–	4
N	(539)	(141)	(50)	(104)

Note: Weighted percentages; unweighted sample Ns

[a] X^2 males = 253.670; df = 18; $p < .001$.

[b] X^2 females, frequent high maximum and frequent heavy drinkers combined = 80.561; df = 15; $p < .001$.

– = 0.5 percent or less.

First-generation U.S.-born men exhibit decreased abstention and increased frequent heavy drinking (table 5). More than half the first-generation men are in the frequent high maximum and frequent heavy drinking categories, compared with 38 percent of the men in the "others" category. Of men born abroad, Mexicans show the highest rate of frequent high maximum and frequent heavy drinking combined–a rate six times higher than that for any other foreign-born group. The predominant pattern of drinking among Puerto Ricans, Cubans, and Latin Americans is of infrequent or less frequent drinking.

Among first-generation women, the rate of abstention decreases and the rate of infrequent drinking increases compared with the rates of the "others" group. U.S.-born women in the "others" category have a rate of abstention similar to the rates of Puerto Ricans and Cubans, but they also have a high percentage of frequent high maximum drinkers. Women born abroad have high rates of abstention. Approximately half of the Puerto Ricans and Cubans and approximately two-thirds of the Mexicans and Latin Americans are abstainers, and those who drink do so lightly. The rate of frequent high maximum or frequent heavy drinking is low across all foreign-born groups.

Controlling for age does not change the associations between drinking pattern and ethnicity for respondents of either sex in the first generation, "others", and Mexican categories. Puerto Rican, Cuban, and Latin American respondents were not included in this analysis because of small sample size.

Predictors of Alcohol Consumption

Multiple linear regression was applied to attempt to identify the best predictors of alcohol consumption (volume of drinking) from among the available sociodemographic variables. The dependent variable

Table 5.—Drinking patterns by birthplace and sex, in percent

Sex/drinking pattern	U.S. born: First generation	U.S. born: Others	Foreign born: Mexico	Foreign born: Puerto Rico	Foreign born: Cuba	Foreign born: Latin America
Males[a]						
Abstainer	17	30	18	27	11	26
Infrequent	4	5	12	6	32	31
Less frequent low maximum	14	3	4	41	41	12
Less frequent high maximum	5	9	10	5	2	7
Frequent low maximum	6	14	12	9	10	9
Frequent high maximum	21	24	23	10	1	12
Frequent heavy drinker	33	14	19	3	3	3
N	(120)	(156)	(181)	(58)	(43)	(40)
Females[b]						
Abstainer	22	44	71	45	48	74
Infrequent	48	10	13	9	35	14
Less frequent low maximum	13	8	6	5	12	4
Less frequent high maximum	3	7	2	29	2	4
Frequent low maximum	3	1	3	6	3	2
Frequent high maximum	7	26	2	1	0	1
Frequent heavy drinker	3	3	2	3	1	7
N	(186)	(204)	(222)	(107)	(47)	(76)

Note: Weighted percentages; unweighted sample Ns.

[a] χ^2 males, U.S. born x Mexicans x all others = 144.564; df = 12; $p < .001$. χ^2 males, foreign born x first generation x all others = 99.688; df = 12; $p < .001$.

[b] χ^2 females, U.S. born x Mexicans x all others with frequent high maximum and frequent heavy drinkers combined = 127.899; df = 10; $p < .001$. χ^2 females, foreign born x first generation x all others = 21.228; df = 12; $p < .001$.

was the base 10 logarithm of the number of drinks respondents consumed per month (see Room 1985 for details). The predictors were either continuous variables, such as age, or dichotomies. Attitude toward alcohol is an index score derived from 11 dichotomous items that assessed respondents' attitudes toward alcohol use and drunkenness. A score of one was given to each positive response by the interviewee. Higher scores indicate more liberal attitudes toward alcohol use.

Three regressions were performed. The first examined predictors of consumption for all drinkers in the sample; the second and the third divided the sample by gender. The first regression indicated in order of importance the following best predictors of high volume drinking: gender (beta = -.275), liberal attitudes toward alcohol use (beta = .245), foreign born (beta = -.127), retired (beta = -.134), some high school education (beta = .151), some college education (beta = .141), and ethnicity other than Mexican American, Cuban American, or Puerto Rican (beta = .062). The F tests for all except the last of these variables showed $p < .001$. Twenty-two percent of the variance was explained by the equation.

The variables most highly related in the separate regressions for males and females are shown in table 6. The predictors of alcohol consumption for each sex vary considerably. Among men, the variables with highest regression coefficients are negatively associated with consumption: having completed high school contrasted against education up to the eighth grade, widowers were contrasted against single individuals, and Cuban Americans contrasted against Puerto Ricans. Among women, the strongest predictors are liberal attitude toward alcohol use and either some high school or some college education. The linear equation seems to fit the data for women better (i.e., 33 percent of the variation explained) than the data for men (16 percent explained).

Table 6.–Standardized regression coefficients from stepwise regression of alcohol consumption on selected variables

Sex/variable	Regression coefficient (beta)	*F* significance
Males		
Income over $30,000	.144	.001
Completed high school	-.190	.001
Catholic	-.131	.001
Widowed	-.189	.001
Cuban American	-.181	.001
Income $6,001-$10,000	-.125	.001
Liberal attitude toward alcohol use	.106	.001
Completed grammar school	-.096	.02
Females		
Liberal attitude toward alcohol use	.375	.001
Frequency of church attendance a few times a year	.124	.001
Some high school education	.349	.001
Some college or more education	.351	.001
Foreign born	-.150	.001
Retired	-.105	.01
Grammar school education	.164	.001
Cuban American	.113	.01
High school education	.183	.001
Catholic	.093	.03

Alcohol Problems by Age and Sex

The questionnaire gathered information on 30 indicators of symptomatic drinking and on any drinking-related social and personal problems that had occurred during the 12 months prior to the survey. About 18 percent of the men and 6 percent of the women reported one or more alcohol problems during the preceding 12 months. This figure decreased as the age of the respondent increased. About 22 percent of the men in the 18-29 age group reported one or more alcohol problems, followed by 18 percent of those in the 30-39 age group, 15 percent of those in the 40-49 age group, 14 percent of those in the 50-59 age group, and 4 percent of those 60 years of age and older. Among women, the following percentages of respondents in each age group reported at least one problem: 18 through 29 years, 10 percent; 30 through 39 years, 3 percent; 40 through 49 years, 4 percent; 50 through 59 years, 3 percent; and 60 years of age and older, zero percent.

A higher cutoff point (i.e., four or more problems reported) changes these percentages. About 6 percent of the men and 2 percent of the women reported problems at this level. Among men, the relationship between the prevalence of four or more problems and age is not linear. The prevalence is approximately the same for men in the 18-29 and 30-39 age groups–7 percent and 6 percent, respectively. The rate then decreases to 4 percent among men 40 through 49 years of age (4 percent) and increases to 10 percent among men 50 through 59 years of age. No men 60 years of age and older reported four or more problems. Compared with men in the youngest age group, few men in the 50-59 age group reported problems; those who did reported more problems than men in the youngest age group. Among women, the decline in the rate of four or more alcohol-related problems occurs mainly after their twenties. Thus, in the 20-29 age group, 5 percent of the women reported four or more problems. For women 30 through 39, 40 through 49, and 50 through 59 years of age, the proportion is 1 percent, and for those 60 years of age and older, zero percent.

Table 7.–Number of problems by birthplace and sex, in percent

	U.S. born		Foreign born			
Sex/problems	First generation	Others	Mexico	Puerto Rico	Cuba	Latin America
Males						
None	72	86	75	95	98	81
One problem	15	7	9	2	0	5
Two problems	2	1	1	0	0	8
Three problems	3	1	3	0	2	0
Four or more problems	7	5	11	3	2	5
N	(120)	(156)	(178)	(57)	(43)	(40)
Females						
None	94	90	96	96	98	97
One problem	3	1	2	2	–	1
Two problems	1	1	0	0	0	1
Three problems	0	1	1	1	0	0
Four or more problems	1	7	1	–	–	1
N	(184)	(202)	(220)	(106)	(47)	(76)

Note: Weighted percentages; unweighted sample Ns.
– = 0.5 percent or less.

Mexican American men reported more problems than other respondents. About 22 percent of the Mexican American men reported at least one drinking problem, compared with 8 percent of the Puerto Ricans, 3 percent of the Cubans, and 13 percent of men in the "others" category. A prevalence of four or more problems was found among 7 percent of the Mexican Americans, 5 percent of the Puerto Ricans, 3 percent of the Cuban Americans, and 5 percent of "others." Among women, 7 percent of the Mexican Americans, 3 percent of the Puerto Ricans and Cubans, and 25 percent of the "others" reported one or more problems. A prevalence of four or more problems was found among 3 percent of the Mexican Americans, 2 percent of the "others," and only 1 percent of the Cuban Americans. None of the Puerto Rican women reported problems at this level.

Classified by birthplace, men from Mexico reported more problems than men in all other groups, followed by first-generation U.S.-born men and U.S.-born men in the "others" category (table 7). Among women, U.S.-born women in the "others" category reported more problems than all other groups, followed by women born in Mexico and those born in other Latin American countries. However, the number of respondents of either sex in this last group, as well as those born in Puerto Rico and Cuba, is small, and thus results should be evaluated cautiously.

Specific Problems by Age and Sex

To examine the prevalence of specific problems by age and sex, alcohol-related problems were grouped in scales according to content (table 8). The first six items are indicators of symptomatic drinking or alcohol dependence; the others represent social or health problems. The most prevalent problems among men who drink are salience of drinking behavior, impaired control over drinking, withdrawal symptoms, health problems, problems with spouse, and problems with other people due to drinking. Salience of drinking behavior is an indicator that evaluates the degree to which drinking interferes with daily activities. "Need to drink" refers to a respondent's incapacity to concentrate on anything other than drinking. "Impaired control" refers to a respondent's inability to control alcohol intake. Prior to the age of 60 years, problems do not decrease substantially with age, so that men in the 50 to 59 age group have as many problems in several areas as men in the youngest age group. After age 59, the prevalence of problems declines sharply. Among women, the most prevalent problems are salience of

Table 8.–Problem type by age and sex, in percent

	Age group					
Problem type	18-29	30-39	40-49	50-59	60+	All
Males						
Salience of drinking behavior	8	9	6	6	0	7
Need to drink	1	–	1	7	0	1
Increased tolerance	3	3	1	1	3	3
Impaired control	8	6	4	10	0	6
Withdrawal symptoms	6	6	2	10	1	5
Binge	2	2	1	4	0	2
Financial problems	1	3	2	4	0	2
Belligerence	6	6	3	3	0	5
Police problems	4	3	1	3	0	3
Accidents	1	–	–	0	0	1
Health	7	6	7	8	0	6
Problems with spouse	6	9	9	6	0	7
Problems with other people	9	6	4	2	0	6
Job problems	4	2	2	5	0	3
N	(203)	(166)	(89)	(63)	(78)	(599)
Females						
Salience of drinking behavior	6	1	–	2	0	3
Need to drink	0	0	–	2	0	–
Increased tolerance	0	0	1	2	0	–
Impaired control	5	1	1	2	0	2
Withdrawal symptoms	1	–	1	2	0	1
Binge	0	0	0	0	0	0
Financial problems	–	0	0	0	0	–
Belligerence	6	2	1	2	0	3
Police problems	1	–	0	4	0	1
Accidents	0	0	0	0	0	0
Health	5	1	3	2	0	3
Problems with spouse	1	–	1	4	0	1
Problems with other people	6	1	1	4	0	3
Job problems	–	0	0	0	0	–
N	(281)	(230)	(127)	(85)	(116)	(839)

Note: Weighted percentages; unweighted sample Ns.
– = 0.5 percent or less.

drinking behavior, impaired control, belligerence, health problems, and problems with other people. Women in the 18-29 age group and in the 50-59 age group have the highest rates of alcohol-related problems.

Discussion

Abstention and Drinking Patterns

Detailed comparison of the results of this research with results of previous surveys is limited to papers with similar methodologies, especially with regard to the classification of drinking patterns. There are three such studies: a poll of the California population (Cahalan et al. 1974), a study of Hispanics in three California locales (Alcocer 1979), and a study of Hispanics in the San Francisco Bay area (Caetano 1984*a*,*b*,*c*). Because much of the impetus for this research came from the San Francisco study, this discussion focuses on a comparison of its results with those of the present national Hispanic sample.

The overall rate of abstention among Hispanic men in the present sample is lower than that of the general U.S. population (Clark and Hilton 1986) but higher than that of northern California Hispanics (22 percent versus 14 percent). U.S. abstention rates are usually higher because general U.S. population samples include respondents from Southern, Prairie, and Mountain States, some areas of which do not allow liquor sales (Cahalan and Room 1974). Abstention rates for California are lower for a number of reasons, including the large number of light drinkers in that State. In view of these considerations, the rate of abstention in the national Hispanic sample was expected to be between that of northern California Hispanics and that of the U.S. general population. Hispanic women in northern California have a 33 percent rate of abstention (Caetano 1984*b*), lower than that found in the present study and in accordance with the fact that California has more light drinkers than other states. The proportion of female to male abstainers in the national Hispanic sample and in the California sample is similar, approximately 2:1.

With regard to alcohol consumption patterns, men in the California Hispanic sample drink more than men in this national Hispanic sample. In the California sample, 22 percent of the men are in the infrequent and less frequent categories combined, compared with 32 percent of the men in the national sample. Also, in the California sample, 24 percent of males are frequent heavy drinkers versus 17 percent in the national sample. Differences among women are more complex. The national sample has a higher rate of frequent high maximum drinking among females than the California sample (9 percent versus 5 percent) but a lower rate of frequent low maximum drinking (3 percent versus 14 percent). In other words, 19 percent of the women in California are frequent drinkers (i.e., drink at least once a week) versus 12 percent in the national sample. But twice as many women in the national sample as in the California sample drink five drinks at a sitting at least once a year. The results for abstention and drinking patterns together indicate that fewer women in the national sample drink and that fewer drink frequently, but that those who drink frequently consume greater amounts per sitting than their counterparts in California.

Abstention, Drinking Patterns, and Sociodemographic Variables

Both abstention and drinking are affected by a number of sociodemographic characteristics. For example, alcohol surveys consistently have found age to be one of the main predictors of drinking, and findings in the general literature consistently have shown that drinking decreases with age (Cahalan et al. 1969; Cahalan and Room 1974; Clark and Midanik 1981). Among men in the California sample, abstention increases from 13 percent for the 18-29 age group to 24 percent for the 50-59 age group (Caetano 1984*b*). Among men in the present sample, however, the relationship between abstention and age is quite different. Across the same age categories as the California sample, abstention rates for males in the national sample vary only from 22 to 24 percent. Only for the oldest age group does the abstention rate noticeably increase. The same pattern is observed among women. In the California sample, abstention gradually increases from 32 percent among women 18 through 29 years of age to 43 percent among women 50 through 59 years of age. In the national sample, abstention increases substantially in the oldest age group, that is, among women 60 years of age and older. This finding is unexpected and difficult to interpret.

Perhaps more important than variations in the abstention rate by age is the change in the rate of frequent heavy drinking. In the California study, Hispanics show a pattern of heavy drinking by age quite different from that described for predominantly non-Hispanic samples. Whereas in non-Hispanic samples heavy drinking decreases dramatically from the twenties to the thirties, the decrease is not as pronounced in the California Hispanic sample (Caetano 1984*b*). Findings from the present study provide even more intriguing results: Among Hispanic men, heavy drinking actually increases from the twenties through the thirties. Thus, the pattern of drinking by age among Hispanics is shown to be quite different from that among Anglos. Whereas Anglos seem to regard heavy drinking as part of a youthful lifestyle, Hispanics appear to accept it at older ages, perhaps as an acquired right of manhood, as has been suggested by ethnographic data (Gilbert 1984).

Two indicators of socioeconomic status were found in this study also to be modifiers of drinking behavior. As shown in table 2 and table 3, both income and education are positively associated with drinking. Those people in the higher income brackets and higher educational groups, especially among males, not only have lower rates of abstention but also have higher rates of heavier drinking. These associations are borne out in the cross-tabulations and also in the multivariate analysis of predictors of drinking. The positive association between education or income and drinking previously has been found for general samples of the U.S. population (Cahalan et al. 1974; Clark and Midanik 1981). In the California Hispanic sample, however, these two variables were found to be positively associated with drinking only among women (Caetano 1984*b*). Regression analysis on alcohol consumption for the entire California sample indicated that education is a positive predictor of drinking in the sample, probably because of its strong association with drinking among women (Caetano 1984*a*). Holck and colleagues (1984) corroborated this result for women in their study of drinking by Mexican American and Anglo women along the U.S.-Mexico border.

Perhaps because 80 percent of the California sample share a Mexican cultureal heritage, drinking habits were found to be fairly uniform across socioeconomic groups. Such homogeneity should not be expected in the national Hispanic sample, for which respondents were selected from different parts of the country, from a variety of backgrounds, and with a much wider range of experiences of life in the United States. Whereas data on cultural attitudes of the various ethnic groups in the national sample are yet to be analyzed, the drinking patterns in this sample show substantial variations. Among both men and women, Mexican American drinkers seem to drink more heavily than drinkers in other ethnic groups. Given the small number of respondents in some of the other ethnic classifications, this finding is tentative. However, data on alcohol-related mortality in selected cities suggest that Mexico has one of the highest rates of alcohol cirrhosis mortality among Latin American countries (Puffer and Griffith 1967). When drinking patterns are analyzed by birthplace, Mexican men have one of the lowest rates of abstention and one of the highest rates of frequent heavy drinking. Mexican women, on the other hand, do not follow this pattern: Compared with other foreign-born women, Mexican women have a high rate of abstention and almost no heavier drinking. Comparative analysis of data on drinking by women in their countries of origin would help to determine whether these patterns are characteristic of women who migrate or, instead, reflect true national differences.

It is tempting to accept birthplace as a crude indicator of acculturation in interpreting variations in drinking patterns between foreign-born respondents and those born in the United States. Thus, the higher rate of frequent heavy drinking among first generation men might be explained by the difficult position of these men caught between the values of their new country and those of their homeland. Because Anglo women seem to drink more than Hispanic women (Caetano 1984*a*; Holck et al. 1984), the difference in the rates of abstention between foreign-born and first-generation U.S.-born women also might be interpreted as an effect of acculturation to U.S. drinking norms. However, this line of thinking does not provide an adequate interpretation of the increased rate of abstention among nonfirst-generation U.S.-born women in the "others" category. Nor do age differences between first-generation women and members of the "others" category explain the difference in their abstention rates. The analysis of drinking, acculturation, and ethnic identity in this national sample is still in progress; future work with these data will examine the relationship between ethnic identity and attitudes and norms toward alcohol consumption.

Drinking Problems

The complexity of interpreting the present data set and the associations shown in the analysis is exemplified by the findings for alcohol-related problems. In line with their heavier drinking habits, Mexican Americans, independent of sex, also reported more drinking problems than respondents in other national groups. But the same association is not found when alcohol problems are cross-tabulated with birthplace. Although one might expect that, among men, U.S.-born first generation respondents would report more problems, this is not strictly the case. Overall, 34 percent of first-generation men who drink reported at least one alcohol problem, compared with 30 percent of the drinkers born in Mexico. On the other hand, Mexican-born drinkers have a high proportion of men with four or more problems. Also, despite the fact that their rate of frequent heavy drinking is hald that of first-generation men, U.S.-born men in the "others" category have a rate of drinkers with four or more problems similar to that of the first-generation men. These findings suggest that first generation men are able to drink more than Mexicans and U.S.-born men in the "others" group without incurring the same level of consequences.

Similarly, a decrease in the rate of abstention among first-generation U.S.-born women does not seem to lead to an increase in the rate of alcohol problems. First-generation women reported approximately the same level of problems as foreign-born women. Their lower rate of abstention apparently is not a result of increased heavy drinking but because instead is attributable to a larger number of infrequent drinkers. U.S.-born female drinkers in the "others" group report the highest level of problems, a circumstance that may be linked to the high rate of frequent high maximum drinking reported by women in this group.

One of the most interesting findings of the study of Hispanics in California was the lack of a decrease in the rate of alcohol problems among men in their twenties to thirties. Regardless of problem type, the rates for men in that sample remain high in the thirties and decline only in the forties (Caetano 1984*a*). As discussed elsewhere (Caetano 1984*a*,*b*), this result is at variance with that for white men in the same sample and with those of previous surveys of the U.S. population as a whole. The proportion of white men with four or more problems in the California sample drops from 6 percent in the 20-29 age group to 3 percent in the 30-39 age group. Data from Cahalan and Room (1974) recalculated by this author show a drop in their "current overall" problem score from 30 percent in the 21-29 age group to 20 percent in the 30-39 group. Clark and Midanik's (1981) data from a 1979 survey of the U.S. general population, recalculated by this author, show rates of drinkers with social consequences that drop from 12 percent in the 18-30 age group to 8 percent in the 31-40 group, and rates for drinkers with loss of control or dependence that decline from 26 percent to 16 percent from the 18-30 to the 31-40 age group. However, the proportion of men reporting four or more problems in the Hispanic national sample is similar in the 18-29 *and* the 30-39 age groups (7 percent and 6 percent, respectively), and only increases for men in their fifties.

Rates for specific problems by age show that the only problems that decline among men in their thirties are impairment of control, problems with other people due to drinking, and job problems. Because men in their thirties have a rate of frequent heavy drinking that is 1.5 times higher than that of men in their twenties, these data indicate that the association between heavier drinking and drinking problems is weaker in the older group. For men in the 50-59 age group, the situation is quite different. A generally lower level of alcohol consumption for men in this group seems to trigger a disproportionate prevalence of problems. Men in the 50-59 age group have a rate of frequent heavy drinking that is about one-half the rate for men in their thirties and one-third the rate for men in their twenties. Their rate of frequent high maximum drinking is only 3 percent, compared with 24 percent for the youngest group and 28 percent for men in the 30-39 age group; yet in many categories, the older men have problem rates higher than those for younger men. This apparent anomaly may be explained by cultural attitudes concerning the amount of acceptable alcohol consumption for people of different ages. Respondents in all Hispanic nationalities indicated that men 30 to 40 years old had more freedom to drink than younger men. This social acceptance may reduce the number of drinking-related social problems among men in their thirties despite their high quantity and frequency of drinking.

Results for problem rates among women are also intriguing. Given their much lower alcohol consumption than men, women drinkers in this sample reported a high rate for some problems. For example, while only 2 percent of women in the 18-29 age group are frequent heavier drinkers, 8 percent reported salience of drinking behavior. Similarly, 6 percent of female drinkers in this youngest age group reported problems of belligerence due to alcohol, 5 percent reported problems with health, and 5 percent reported impaired control over drinking. These rates are almost as high as those reported by men in the same age group, even though the rate of heavy drinking among men is eight times higher. Also, while drinking by women in their thirties does not differ considerably from drinking among the younger age group, the drop in the rate of problems between these two age groups is significant. These results for young women, together with the previously noted results for men in their fifties, suggest that there are mechanisms other than rate of alcohol consumption at work in the patterning of drinking problems by age. These women may be overreporting their problems, or social control over their drinking may be so stringent that drinking even small amounts of alcohol may lead to serious consequences.

Conclusion

Some of the results reported here replicate findings in the literature–findings reported from analyses of general samples or samples of regional Hispanic populations. This is the case with the positive associations between education, income, and drinking and with the patterning of drinking by age. Other results are reported for the first time for a national sample; these include drinking by birthplace, by generational status, and by ethnic self-identification. All these results need confirmation. Whereas studies of drinking habits and alcohol-related problems in U.S. general samples began in the mid-1960s and their results can be compared across samples spanning 20 years, this is the first report on a representative sample of U.S. Hispanics. The lack of other reports with which to compare these results suggests cautious interpretation. This caution is especially true for results from those national groups, such as Cubans and Puerto Ricans, for which the number of respondents in this sample is small. Some of the variations in drinking patterns and alcohol problems across different Hispanic groups may be linked to different norms and attitudes governing the use of alcohol or to different patterns of intoxication. These attitudes will be studied in a forthcoming analysis of these data.

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Prevalence of Alcohol Abuse and Dependence Among Mexican Americans and Non-Hispanic Whites in the Community

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ABSTRACT

Lifetime prevalence of DSM-III (*Diagnostic and Statistical Manual of Mental Disorders*) diagnoses of alcohol abuse and dependence, and severity of disorder among those with a lifetime diagnosis, were assessed as part of a structured survey interview among Mexican Americans and non-Hispanic whites in a Los Angeles community sample. Higher prevalence of alcohol disorder was found among Mexican American men relative to non-Hispanic white men, particularly in the oldest age group, while Mexican American women had lower rates of disorder than non-Hispanic white women. After controlling for age and educational level, the ethnic difference found among men was evident. Among women, the ethnic difference was found to be insignificant when controlling for education.

Among persons with an alcohol abuse diagnosis, no substantial differences between Mexican Americans and non-Hispanic whites were found in severity of disorder. However, Mexican American women tended to have a later age of onset and a shorter duration of alcohol abuse or dependence than non-Hispanic white women or men of either ethnic group.

Introduction

Several recent research reviews on alcohol use have suggested that the prevalence of problem drinking may be higher among Hispanic Americans, particularly for Hispanic males, relative to the general U.S. population and that special attention should be focused on prevention and treatment activities in this population (Hall et al. 1977; Noble 1978; Gomberg 1982; Alcocer 1982). This finding is a significant public health issue because of the growing size of the Hispanic population in the United States. According to the 1980 census, Hispanics number over 14.6 million and are expected to be the largest ethnic minority group in this country by the year 2000 (Macias 1977). In addition, because the median income level of Hispanic households is considerably lower than that of non-Hispanic households (U.S. Bureau of the Census 1981), Hispanic Americans with alcohol-related problems may be less likely to have access to adequate care for these problems.

Limited data are available regarding the prevalence of alcohol use and alcohol-related problems among U.S. Hispanics. A review of published quantitative studies uncovered several community survey reports that assessed levels of drinking or alcohol problems use among Hispanic samples of different regional and cultural backgrounds: Puerto Ricans in

New York City (Haberman and Sheinberg 1967); low-income Mexican American women in Brownsville, Texas (Maril and Zavaleta 1979); Mexican Americans in a Houston community (Paine 1977); Spanish Americans in a small Colorado town (Graves 1967); adults of unspecified Latin American or Caribbean origin included in a national probability sample (Cahalan and Room 1972); Hispanics in northern California (Caetano 1984*a*); and Mexican American women along the U.S.-Mexico border (Holck et al. 1984). Although the Hispanic samples in many of these studies were small, the data from these and previous studies have been consistent in suggesting higher prevalence of current heavy alcohol drinking and alcohol-related problems among Hispanic compared with non-Hispanic males. Among females, Hispanics were found to be either equally or less likely than non-Hispanics to drink heavily and have alcohol-related problems. Analyses of public record information generally have supported this impression, showing higher death rates due to cirrhosis of the liver, higher arrest rates for public drunkenness and drunk driving, and a greater number of alcohol-related accidents among U.S. Hispanics than the general population (Hall et al. 1977; Alcocer 1982). No previous epidemiologic studies have assessed prevalence of diagnostic levels of alcohol abuse and dependence among Hispanic American populations.

The major purpose of this paper is to describe the prevalence of diagnostic levels of alcohol abuse and dependence among Mexican Americans in a Los Angeles household population and to compare these prevalence rates with those of non-Hispanic whites in the population. These data are from the Los Angeles Epidemiologic Catchment Area (LA-ECA) study, one of five studies of the National Institute of Mental Health's (NIMH) collaborative ECA program.[1] This program was designed to provide estimates of the prevalence of major psychiatric disorders in several geographically defined sites in the United States, using the current *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III) diagnostic criteria of the American Psychiatric Association (1980). The Los Angeles study focuses on Mexican Americans, the largest of the Hispanic American cultural groups, as a special population.

A second purpose of this paper is to compare the severity of disorder in Mexican Americans and non-Hispanic whites who meet the criteria for the diagnoses of alcohol abuse or dependence to examine whether their cultural or ethnic background influences the expression or form of alcohol disorder. For example, Negrete (1980) proposed that the sociocultural setting can affect the degree of disability associated with alcoholism. Specifically, he hypothesized that in societies that are more permissive toward alcoholism, alcoholics may be less disabled by alcohol use (i.e., less likely to have problems as a result of heavy alcohol use) than alcoholics in societies that have strong social sanctions against alcoholism. This hypothesis was supported by a study of French Canadians and Anglo Canadians being treated for alcoholism (Negrete 1980). A number of researchers have noted lenient attitudes toward male drinking and prohibitive attitudes toward female drinking in the Mexican culture (Madsen 1964; Paine 1977; Maril and Zavaleta 1979; Johnson and Matre 1978; Melus 1980; Caetano 1984*a*). According to these studies, Mexican Americans are more likely to believe that getting drunk is acceptable for men and that people who drink have more fun and make friends and to condone drinking at social functions. In contrast, they are less likely to believe that getting drunk is acceptable for women. Negrete's hypothesis would lead us to assume that Mexican American male alcoholics have a less severe disorder than their non-Hispanic white counterparts and that Mexican American female alcoholics have more severe levels of disorder than their non-Hispanic white counterparts.

An alternative hypothesis is that more permissive attitudes toward alcoholism will reduce the likelihood of remission among those with alcohol problems, prolong the duration of alcohol abuse in an individual's life, and increase the severity of disorder resulting from alcohol use. Indirect evidence for alcohol abuse of longer duration among Mexican Americans is provided by cross-sectional data showing the prevalence of alcohol problems in different age groups. Caetano (1984*a*) reported higher prevalence of current alcohol problems for Hispanic men in their thirties relative to those in their twenties, in contrast to the pattern for whites and other general population samples, which show the highest level of problems among men in their twenties and decreasing alcohol problems in older age groups. One possible explanation for this finding is that the duration of heavy drinking and related problems are greater for Hispanic men than for non-Hispanic men. Based on a literature review, no studies directly examining the severity of alcohol disorder have been conducted among Mexican American populations.

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[1] The Epidemiologic Catchment Area Program is a series of five epidemiologic research studies performed by independent research teams in collaboration with staff of the Division of Biometry and Epidemiology of the National Institute of Mental Health. The five sites are New Haven, Conn., Baltimore, Md., St. Louis, Mo., Los Angeles, Calif., and North Carolina.

Methods

The LA-ECA study, like those in the four other ECA sites, was designed to estimate the prevalence and incidence of disorders for specific geographically defined populations in diverse U.S. sites. The design of the studies has been thoroughly described elsewhere (Regier et al. 1984; Eaton et al. 1984; Eaton and Kessler 1985). Each site conducted direct interviews with at least 3,000 adults, who formed a probability sample of the household population of one or more mental health catchment areas. In addition to sampling the household population in the catchment areas, persons in institutional settings–prisons, mental hospitals, or homes for the elderly–also were sampled. Approximately 500 of these institutional residents were interviewed at each site. Both the household and institutional samples were recruited for direct followup interviews conducted 1 year later to assess changes in diagnostic status and any intervening use of health services. For the household sample, a brief telephone followup interview was conducted 6 months after the initial interview to collect data on any recent use of health services. The present analysis is based on data collected in the initial wave of interviews conducted with the Los Angeles household sample.

Sample

The population of the LA-ECA study was selected from two catchment areas in metropolitan Los Angeles. One of these areas contains a population that is predominantly Hispanic American (83 percent); the second has a largely non-Hispanic white population (63 percent), with a smaller Hispanic population (21 percent). The Hispanic Americans in both catchment areas are primarily of Mexican ethnic origin.

The sample, stratified by catchment area, was a two-stage area probability sample. Primary sampling units were blocks or groups of blocks, and secondary sampling units were households. The sample was designed to give each household in the two catchment areas an equal probability of selection. One adult from each household was then randomly selected for inclusion in the study, using a selection procedure recommended by Kish (1965). A total of 3,117 adults were interviewed, with an overall completion rate of 68 percent.

Measures

Psychiatric disorders were assessed by using the NIMH Diagnostic Interview Schedule (DIS) to obtain DSM-III diagnoses. This instrument is a highly structured interview schedule that can be administered by trained lay interviewers (Robins et al. 1981). To arrive at a diagnosis, a computerized scoring algorithm is applied to the precoded information regarding signs and symptoms of the disorders. Studies evaluating the adequacy of the DIS as a diagnostic instrument have indicated that DSM-III diagnoses of alcohol abuse or dependence obtained by using the DIS have high test-retest reliability. The DIS also displayed a high degree of validity when diagnoses based on lay interviews were compared with those made by psychiatrists who also used the DIS but were free to ask additional questions and to come to their own judgments (Robins et al. 1981; Robins et al. 1982; Helzer et al. 1985).

To meet criteria for the diagnosis of alcohol abuse, DSM-III specifies that an individual must show a pattern of pathological alcohol use, impairment in social or occupational functioning due to alcohol use, and at least a 1 month duration of disturbance. The alcohol dependence diagnosis requires either a pattern of pathological alcohol use or impairment in social or occupational functioning, plus evidence of tolerance or withdrawal. A summary of the items contained in the DIS that are used to make these diagnoses is shown in table 1.

The DIS has been translated into Spanish, and the Spanish version was tested for equivalence to the English version in a study of bilingual and monolingual Spanish-speaking patients of a Los Angeles community mental health center (Karno et al. 1983; Burnam et al. 1983). As in studies of the English DIS, the Spanish DIS alcohol diagnoses attained high test-retest reliability among monolinguals and high agreement when English and Spanish DIS versions were compared among bilinguals (Burnam et al. 1983). Individuals who participated in the LA-ECA study were given the option of taking the interview in English or Spanish. The survey instrument format allowed easy switching from one language to another if desired.

Table 1.–DIS/DSM-III alcohol disorder measure summary

Alcohol abuse–Both criteria below required

Criterion A (pathological use)
One of the following is present:

1. Wanted to stop drinking but couldn't.
2. Tried to control drinking.
3. Drank as much as a fifth of liquor (or equivalent in wine or beer) in 1 day.
4. Had blackouts while drinking.
5. Continued to drink when a serious illness might be made worse.
6. Period when could not do ordinary daily work well unless had something to drink.
7. Two or more benders that each lasted at least a couple of days.

Criterion B (impairment in social or occupational functioning)
One of the following is present:

1. Family objected because drinking too much.
2. Friends, doctor, clergy, or other professional said drinking too much for own good.
3. Had job or school troubles because of drinking.
4. Lost job or kicked out of school on account of drinking.
5. Got into trouble driving because of drinking.
6. Was arrested or held at police station because of drinking or disturbing the peace while drinking.
7. Got into physical fights while drinking.

Alcohol dependence–Both criteria below required

Criterion A (either pathological use or impairment in social and occupational functioning as assessed for alcohol abuse above)

Criterion B (tolerance or withdrawal)
One of the following is present:

1. Period of 2 weeks when every day drank seven or more drinks.
2. Needed a drink just after getting up.
3. Had "the shakes" after stopping or cutting down on drinking.

Analytic Procedures

In all analyses, data were weighted to adjust for differential probability of sample selection. Because households in the two catchment areas had an equal probability of selection, the weight adjusts only for differential probability of selection due to varying sizes of households. Data have not been adjusted for probability of nonresponse in these analyses.

For diagnoses and symptoms of alcohol disorder, differences in prevalence by ethnic background and other demographic variables were tested for significance by using loglinear analyses. A weighted least-squares method was employed using the FUNCAT program of the Statistical Analysis System (1982). The model tested resembled an analysis of variance model, with all main effects and interactions simultaneously entered as predictors of each categorical alcohol outcome variable. Analysis of variance was employed for alcohol outcome variables measured as a continuous dimension, such as duration of alcohol problems. When main effects and interactions were found significant by the analytic models, differences between specific groups were examined with t-tests or chi-square statistics.

Results

Ethnic Subsamples

Ethnic backgrounds of persons in the LA-ECA household sample were largely determined on the basis of a question that asked the respondents to choose from a list of ethnic groups the one that best described their cultural or ethnic background. When self-identification was ambiguous (e.g., American), questions regarding parents' ethnic or cultural background, parents' country of birth, and respondent's country of birth were used to classify ethnic background. The LA-ECA sample by sex, age, and ethnic composition is shown in table 2. Most of the persons in the sample were either non-Hispanic whites (N = 1,310) or of Mexican background (N = 1,245). The sample also included some persons of other Hispanic cultural backgrounds, originating from many Central American and South American countries and from Spain. Because Hispanic subgroups may differ in their use of alcohol, the relatively few persons from other Hispanic backgrounds (N = 184) were excluded from this analysis rather than combined with the Mexican American sample. Similarly, persons from other ethnic and racial groups (N = 393) were excluded from this analysis because of the heterogeneity they represented. These other groups included black Americans and persons of diverse Asian, Pacific Island, Middle Eastern, and American Indian backgrounds, none of which had a sufficiently large subsample size for separate estimates of prevalence of alcohol disorders. Because this report on prevalence and severity of alcohol disorders focuses on ethnic comparisons, the results are restricted to the Mexican American and non-Hispanic white subsamples. The Mexican American and Anglo subsamples had similar distributions by sex, but differed in their age distributions, with higher proportions of Mexican Americans in the youngest age category (18-29 years) and higher proportions of non-Hispanic whites among persons 50 years of age or older (table 2).

Prevalence of Alcohol Abuse and/or Dependence

A lifetime diagnosis was considered present if an individual reported ever having sufficient alcohol problems to meet DIS/DSM-III criteria for either abuse or dependence. Current disorder was defined as occurring within the past month or within the past year and was based on the most recent alcohol problem. The effects of sex and ethnicity and their interaction on lifetime prevalence rates were tested in a loglinear model, resulting in a highly significant interaction of sex and ethnicity (table 3). Among males, a lifetime alcohol diagnosis was more prevalent for Mexican Americans, whereas among females, an alcohol diagnosis was significantly more prevalent among non-Hispanic whites. In addition, the main effect of sex was highly significant. For non-Hispanic whites, the rate of alcohol disorder among males was 2.3 times that of females, and among Mexican Americans, the rate for

Table 2.—Unweighted sample size by sex, age, and ethnicity

Sex/ethnicity	Age group				
	18-29	30-39	40-49	50+	Total
Males					
Non-Hispanic white	197	163	83	188	631
Mexican American	222	156	79	134	591
Other Hispanic	28	23	7	10	68
Other	67	53	23	46	191
Total	514	395	192	378	1,481
Females					
Non-Hispanic white	165	187	83	239	679
Mexican American	232	150	87	182	654
Other Hispanic	33	39	12	30	116
Other	59	68	31	41	202
Total	489	444	213	492	1,651

Table 3.—Prevalence of alcohol abuse and/or dependence by sex and ethnicity

Sex/period of alcohol diagnosis	Mexican American		Non-Hispanic white	
	Percent of total persons	Percent of persons with diagnosis	Percent of total persons	Percent of persons with diagnosis
Males				
Within past month	6.6	20.5	3.7	17.8
Within 2-12 months	6.5	20.2	4.1	19.7
Greater than 1 year	19.1	59.3	13.1	62.5
Anytime in life	32.2	100.0	21.0	100.0
Females				
Within past month	.8	17.7	2.6	28.9
Within 2-12 months	1.1	24.2	.8	8.7
Greater than 1 year	2.6	58.1	5.7	62.5
Anytime in life	4.5	100.0	9.1	100.1

Note: χ^2 sex = 149.2, df = 1, $p < .001$; χ^2 sex x ethnicity = 24.5, df = 3, $p < .0001$.

males was more than seven times greater than that for females.

Prevalence rates by two current prevalence periods show that for all age and ethnic groups, about one-third of the lifetime prevalence was also current within the past year, whereas about two-thirds of those receiving a diagnosis had no symptoms in the past year (table 3). Thus, the pattern of lifetime diagnoses by sex and ethnicity was repeated for current prevalence, with a greater percentage of Mexican American males and a lower percentage of Mexican American females having current alcohol diagnoses.

Because the Mexican American and non-Hispanic white adult populations differed in age distribution, with higher proportions of young adults among Mexican Americans, a further examination of ethnic differences in lifetime prevalence of alcohol disorders was performed with age controlled (table 4). These results showed a significant main effect for age, reflecting a lower lifetime prevalence of alcohol abuse or dependence among all women 50 years of age and older and among non-Hispanic white males 50 years of age and older. Among Mexican American males, however, lifetime prevalence of an alcohol diagnosis displayed a different pattern; that is, prevalence was relatively constant across the age groups, ranging from 26.2 percent among those aged 40-49 years to 37.3 percent among those 30-39 years of age. The main effect of sex and the interaction of sex and ethnicity remained highly significant. Thus, even after controlling for age, Mexican American men had higher rates of alcohol abuse/dependence than non-Hispanic white men, and Mexican American women had lower rates than non-Hispanic white women.

Socioeconomic status is another important factor to be taken into account when comparing rates of alcohol abuse and dependence across ethnic groups. Among the sampled Mexican Americans, 56 percent of the men and 60 percent of the women had less than a high school education, whereas only 11 percent of non-Hispanic men and women had not graduated from high school. The difference in educational levels between the two groups appears large enough to suggest that ethnic differences in rates of alcohol disorders, particularly those found among men, could be accounted for by lack of education or concomitant socioeconomic strains. In order to examine ethnic differences with effects of education controlled, it was necessary to restrict the analysis to one education level—a high school degree but no further education. This level was chosen because the number of Mexican Americans available for comparison at higher educational levels was insufficient, and too few non-Hispanic whites with lower educational levels were included in the sample.

Among those with a high school education, the sex difference in rates of alcohol disorder remained highly significant (table 5). However, the effect of age was reduced to an insignificant level. Although the sex by ethnicity interaction was significant, indicating the same pattern of ethnic differences as found in the previous

Table 4.–Percentage with lifetime alcohol diagnosis by sex, age, and ethnicity

Sex/ethnicity	Age group 18-29	30-39	40-49	50+
Males				
Mexican Americans	30.5	37.3	26.2	33.4
Non-Hispanic whites	22.2	21.7	24.1	17.8
Combined	27.3	30.6	25.3	25.5
Females				
Mexican Americans	5.4	3.9	7.0	2.4
Non-Hispanic whites	11.7	9.7	13.8	4.8
Combined	7.8	6.8	9.8	3.6

Note: χ^2 sex=127.4, df=1, $p<.0001$; χ^2 age=7.9, df=3, $p<.05$; χ^2 sex x ethnicity=22.0, df=1, $p<.0001$.

Table 5.–Percentage with lifetime alcohol diagnosis by sex, age, and ethnicity among persons with only high school degree

Sex/ethnicity	Age group 18-29	30-39	40-49	50+	Total
Males					
Mexican Americans	21.4	36.7	44.7	53.7	32.8
N	(90)	(45)	(24)	(27)	(187)
Non-Hispanic whites	36.8	15.2	23.3	14.0	22.9
N	(38)	(17)	(22)	(47)	(124)
Females					
Mexican Americans	11.8	10.0	6.7	3.3	9.2
N	(81)	(35)	(23)	(31)	(170)
Non-Hispanic whites	21.7	17.7	3.9	6.8	11.9
N	(35)	(26)	(13)	(75)	(149)

Note: χ^2 sex=21.6, df=1, $p<.0001$; χ^2 sex x ethnicity=3.8, df=1, $p<.05$.

analyses, the magnitude of the relationship was reduced. This reduction was largely due to the higher rate of alcohol abuse/dependence among Mexican American women, which, at this educational level, was not significantly different from that of non-Hispanic white women. Thus, for those with a high school education, the rate of alcohol disorder among non-Hispanic white women was only 1.3 times higher than that of Mexican American women. For all educational levels, however, the rate among non-Hispanic white women was twice that among Mexican American women.

To examine whether the association of educational level and lifetime alcohol disorders is similar among Mexican Americans and non-Hispanic whites, analyses of the effects of education were conducted separately for each ethnic group. Among Mexican Americans, two educational categories were compared--persons with less than 12 years of education and those with a high school degree or more. For non-Hispanic whites, persons with a high school degree or less education and those with at least some college education were the categories used in the analysis. The results of the Mexican American subsample analysis are shown in table 6. The main effect of education was significant, with sex and age controlled. Mexican Americans with at least a high school education had higher rates of alcohol disorder than those with less education. However, this pattern did not hold for all sex and age groups. The effects of education were noted most dramatically for women, with higher educated women having almost three times as great an incidence of disorder as lower educated women. Educational level among males showed no systematic relationship to prevalence of alcohol disorder across age categories, and the effect of education, when aggregating over all ages, was insignificant.

The effect of education also was found significant in the analysis of the non-Hispanic white subsample (table 7). Lower levels of education tended to predict higher rates of alcohol disorder, particularly among non-Hispanic women. Age was significantly related to lifetime alcohol disorder, a finding previously discussed as largely due to the lower rates of disorder among persons aged 50 years or older. This finding differs from the findings for Mexican Americans, whose rates among men did not significantly vary as a function of age.

Disorder Severity Among Persons with Alcohol Abuse or Dependence

Two analyses were conducted to determine whether differences in symptoms of alcoholism or aspects of the natural history of alcohol disorder differ for Mexican Americans compared with non-Hispanic whites. Both analyses were restricted to the subgroup of persons who had ever met DIS/DSM-III criteria for either alcohol abuse or dependence.

The first analysis was conducted to examine differences in proportions of persons having the specific DSM-III diagnoses of alcohol abuse only, alcohol dependence only, or both abuse and dependence. No significant sex or ethnic effects were found (table 8). Overall, about half of those with an alcohol diagnosis reported both abuse and dependence. Abuse without dependence also was common, but only about 1 in 10 persons showed a pattern of dependence without meeting the criteria for abuse.

The percentage of persons with an alcohol disorder who reported that at least one alcohol problem occurred within the past 3 years also was examined. Over half had a problem within that time, with no significant differences in proportion by sex or ethnicity. Sixty-one percent of Mexican American males and 66 percent of Mexican American females reported problems in the past 3 years compared with 58 percent of non-Hispanic white males and 59 percent of non-Hispanic white females. There was no evidence, then, of more successful remission of alcohol abuse and dependence for any sex or ethnic group.

Table 9 presents data regarding three additional features of the course of alcohol disorder: The age at which the first problem of abuse or dependence occurred, the number of years between the first and last time a problem occurred, and the total number of problems of abuse and dependence experienced. Analyses of variance were conducted to examine the effects of sex and ethnicity on these alcohol disorder measures. Because each of the measures was likely to be influenced by the differences in age distribution of Mexican Americans and non-Hispanic whites, the analysis was conducted with age as a covariate. Adjusted means are shown in table 9.

For age at which the first alcohol problem was experienced, both a significant main effect for sex and a significant sex by ethnic interaction emerged. Women tended to experience their first problem later in life than men, although the mean age for both men and women occurred in the twenties. However, the sex difference was largely influenced by Mexican American women, who tended to have their first problem at a later age than non-Hispanic white women or men of either ethnic group; no significant differences were

Table 6.—Percentage with lifetime alcohol diagnosis by sex, age, and education among Mexican Americans

	Age group				
Sex/education	18-29	30-39	40-49	50+	Total
		Males			
11th grade or less	32.5	41.1	22.6	30.6	32.6
N	(145)	(88)	(52)	(116)	(400)
High school degree or more	28.6	32.1	30.9	41.8	31.5
N	(154)	(80)	(41)	(40)	(315)
		Females			
11th grade or less	2.1	1.8	5.0	2.3	2.6
N	(120)	(86)	(71)	(132)	(409)
High school degree or more	8.1	7.2	12.1	2.5	7.5
N	(150)	(56)	(29)	(40)	(275)

Note: χ^2 sex = 94.1, df = 1, $p < .0001$; χ^2 education = 4.6, df = 1, $p < .03$.

Table 7.—Percentage with lifetime alcohol diagnosis by sex, age, and education among non-Hispanic whites

	Age group				
Sex/education	18-29	30-39	40-49	50+	Total
		Males			
High school or less	37.8	26.2	26.8	16.3	24.4
N	(45)	(21)	(28)	(87)	(182)
Post high school	17.0	20.8	22.1	19.5	19.2
N	(137)	(107)	(39)	(75)	(358)
		Females			
High school or less	19.1	17.0	16.3	7.9	12.4
N	(45)	(30)	(22)	(116)	(212)
Post high school	9.0	7.9	12.6	0	7.3
N	(118)	(122)	(48)	(73)	(361)

Note: χ^2sex = 19.5, df = 1, $p < .0001$; χ^2age = 8.5 df = 3, $p < .04$; χ^2education = 8.6, df = 2, $p < .003$.

Table 8.–Percentage with type of diagnosis among persons with alcohol diagnosis by sex and ethnicity

Diagnosis	Males: Mexican Americans	Males: Non-Hispanic whites	Females: Mexican Americans	Females: Non-Hispanic whites
Abuse only	41.6	31.3	45.2	42.3
Dependence only	9.0	17.4	16.1	10.6
Abuse and dependence	49.5	51.3	38.7	47.1
Number with any diagnosis	(231)	(113)	(32)	(53)

observed among these last three groups.

The findings for duration of alcohol problems paralleled the results for age of the first problem. Mean years duration of alcohol problems was significantly greater among men than women. In addition, a significant interaction of sex and ethnicity was found. Mexican American women had a shorter duration of alcohol problems than non-Hispanic white women, while non-Hispanic white women and men from both ethnic groups did not significantly differ in mean duration of alcohol problems.

Mean number of alcohol problems did not vary significantly by sex or ethnicity. Thus, although age of onset and resulting duration of alcohol problems were found to be delayed among Mexican American women with an alcohol diagnosis relative to other sex and ethnic groups, the severity of the disorder, as indicated by the number of problems experienced, was no less.

To determine whether patterns of specific types of alcohol problems differed by ethnicity and sex among persons with an alcohol diagnosis, an analysis was performed for each of 24 alcohol problems assessed as part of the DIS. Seventeen of these problems are used to make the DIS/DSM-III diagnoses (see table 1). The remaining problems included two items concerning heavy drinking ("Thought you were an excessive drinker" and "Drank as much as seven drinks a week for 2 months or longer") and five items related to physical complications associated with heavy and prolonged alcohol drinking (liver disease, vomiting blood, numbness, memory trouble, and pancreatitis). The percentages of persons with an alcohol diagnosis who reported having each problem are presented in table 10. Only one significant main effect for ethnicity resulted: Mexican Americans with an alcohol disorder had less frequently considered themselves excessive drinkers than had non-Hispanic whites ($X^2 = 6.5$, df = 1, $p = .01$). For one additional alcohol problem, getting into trouble driving because of drinking, a significant interaction of sex and ethnicity was found ($X^2 = 4.9$, df = 3, $p = .03$). This effect was due to the lower proportion of Mexican American women relative to non-Hispanic women who reported this problem. However, if fewer Mexi-

Table 9.–Mean age of first problem, mean duration, and mean number of problems by sex and ethnicity, adjusted for age among persons with alcohol diagnosis

Variable	Males: Mexican Americans	Males: Non-Hispanic whites	Females: Mexican Americans	Females: Non-Hispanic whites
Mean age of first problem	22.7	23.0	27.9	23.6
Mean years of duration	15.7	14.6	9.6	14.3
Mean number of problems	5.2	5.5	4.4	5.6

Note: For age first problem: χ^2 sex=6.8, df=1, $p<.01$; χ^2 sex x ethnicity=4.3, df=1, $p<.04$; χ^2 age=131.9, df=3, $p<.0001$. For years duration: χ^2 sex=7.7, df=1, $p<.006$; χ^2 sex x ethnicity=6.0, df=1, $p<.02$; χ^2 age=476.2, df=3, $p<.0001$.

Table 10.–Percentage reporting each of 24 alcohol problems among persons with alcohol diagnosis

Alcohol problem	Males: Mexican Americans	Males: Non-Hispanic whites	Females: Mexican Americans	Females: Non-Hispanic whites
Family objected	69.2	55.4	63.0	55.8
Thought excessive drinker	58.8	66.5	51.6	75.0
Fifth in a day	71.7	72.8	48.4	44.7
2 weeks with 7 drinks per day	39.6	54.0	33.9	43.3
2 months with 7 drinks per week	34.6	45.3	46.8	44.2
Professional advised drinking too much	33.5	34.8	53.2	54.8
Wanted to stop but couldn't	21.5	21.9	45.2	26.9
Tried to control drinking	17.1	19.6	24.2	24.0
Need a drink before breakfast	22.5	22.8	17.7	26.9
Job or school troubles	13.4	19.6	14.5	25.0
Lost job	7.2	11.2	0	14.4
Trouble driving	43.3	37.1	14.5	34.6
Arrested	29.8	33.9	6.5	20.2
Fights	38.1	40.2	19.4	32.7
Two or more binges	29.7	28.4	17.0	26.0
Blackouts	50.0	49.5	49.2	66.4
Shakes	18.0	26.6	23.7	27.9
Liver disease	1.6	4.7	8.5	4.8
Vomiting blood	10.4	9.4	5.1	11.5
Numbness	2.3	4.2	1.7	15.4
Memory trouble	4.3	7.8	10.2	10.6
Pancreatitis	1.4	13.8	10.3	21.2
Drank when ill	11.0	13.8	10.3	21.2
Needed drink to work	6.8	12.0	11.9	18.3

can American women drive, this difference may reflect less opportunity to get into trouble driving rather than less alcohol-related impairment in social functioning. Because only 2 of 24 alcohol problems showed significant influences of ethnicity (one significant effect is expected to occur by chance alone), the overall evidence regarding patterning of symptoms in those who have an alcohol diagnosis suggested no substantial differences between Mexican Americans and non-Hispanic whites.

Stronger support for sex differences in patterning of alcohol problems was found. Seven problems differed significantly by sex. Men were more likely than women to have drunk as much as a fifth of liquor in a day ($X^2 = 17.3$, df = 1, $p = .0001$), to have gotten into trouble driving because of drinking ($X^2 = 6.5$, df = 1, $p = .01$), to have been arrested because of drinking ($X^2 = 9.0$, df = 1, $p = .003$), and to have gotten into physical fights while drinking ($X^2 = 4.6$, df = 1, $p = .03$). Women, on the other hand, had more frequently been advised by a professional that they were drinking too much ($X^2 = 10.2$, df = 1, $p = .001$), had wanted to stop drinking but could not ($X^2 = 6.2$, df = 1, $p = .01$), and had experienced pancreatitis ($X^2 = 4.2$, df = 1, $p = .04$).

Discussion

The present survey showed a higher prevalence of alcohol abuse and dependence among Mexican American men relative to non-Hispanic white men and a lower prevalence of these alcohol disorders among Mexican American women relative to non-Hispanic white women. These results are consistent with previous surveys of drinking and alcohol problems conducted among Hispanic American samples and extend the prior epidemiologic findings to include clinical levels of abuse and dependence corresponding to currently accepted diagnostic criteria. Thus, lifetime and current prevalence of alcohol diagnoses show similar patterns of ethnic differences, as do nondiagnostic assessments of current quantity and frequency of drinking and current problems with alcohol. The difference in lifetime rates of alcohol abuse or dependence among Mexican American men compared with non-Hispanic white men was evident even after controlling for age and educational level. Among women, controlling for age did not reduce the difference in rates between Mexican Americans and non-Hispanic whites, but the ethnic difference was diminished to a nonsignificant level when comparing women of the same educational level.

These results also can be compared to lifetime rates of alcohol disorders reported from three other ECA sites (New Haven, Baltimore, and St. Louis) that used the same study design and diagnostic assessment instrument as the present survey (Robins et al. 1984). Rates of alcohol disorders among men at these three sites ranged from 19.1 percent in New Haven to 28.9 percent in St. Louis. Mexican American men in the Los Angeles ECA had a higher rate (32.2 percent) than men at any other site, whereas Los Angeles non-Hispanic white men had a rate (21 percent) within the range of male rates at the other three sites. For women, rates of disorders at the three other sites varied from 4.2 percent to 4.8 percent. In Los Angeles, Mexican American women had a similar rate (4.5 percent), whereas non-Hispanic white women had a higher rate (9.1 percent). These differences must be interpreted cautiously because the estimates have not been adjusted for variations in the age of the populations at the different sites. However, the pattern consistently indicates high rates of alcohol disorder among Mexican American men relative to other men. Although lower rates were found for Mexican American women compared with Los Angeles non-Hispanic white women, the latter women may have exceptionally high rates compared with women in other areas of the United States.

A number of factors may contribute to different rates of alcohol abuse among Mexican Americans and non-Hispanic whites, and these factors have been discussed in reviews by Schaefer (1982), White (1982), Alcocer (1982), and Gomberg (1982). One likely influence consists of culturally defined attitudes and beliefs that encourage (or at least tolerate) heavy drinking among men and discourage it among women. The attitude that heavy drinking is more acceptable for men than for women is probably not unique to the Mexican American subculture and may, to a large degree, account for the higher rates of alcohol abuse among men compared with women in the general U.S. population. However, attitudes toward drinking among Mexican Americans have demonstrated greater divergence by sex than those among the Anglo American culture (Maril and Zavaleta 1979; Johnson and Matre 1978; Caetano 1984*a*). Another possible explanation for ethnic differences in rates of alcohol disorders is that social stresses associated with poverty, minority status, and acculturation strain may create a high degree of social alienation and frustration for which alcohol abuse becomes a common means of escape. Physiological or personality factors also may result in greater vulnerability of individuals in some ethnic or cultural groups, but at present no evidence exists for either personality or physiological differences among Mexican Americans that might account for different rates of alcohol abuse.

Of these explanations, the one most consistent with the current data is that of culturally defined attitudes that involve different normative expectations for men and women. Although social stress also may play a role, given the lower socioeconomic status of Mexican Americans relative to the general population, it would not explain lower rates of alcohol abuse among Mexican American women compared with their non-Hispanic white counterparts (unless the hypothesis was further elaborated to predict that social stress increases alcohol abuse for men but decreases it for women). In addition, neither the present study nor that of Caetano (1984*b*) found higher rates of alcohol use or abuse among Mexican Americans of lower educational levels. Education, as an indicator of socioeconomic status, would be expected to be negatively associated with rates of alcohol use and abuse if social strain contributes to higher rates of alcohol abuse among Mexican American men. Instead, education in this study was found to be unrelated to rates among Mexican American men and was found to be positively related to higher rates among Mexican American women. One explanation for increased rates of alcohol disorder among Mexican American women with higher education is that acculturation to Anglo American values may reduce social restraints on drinking. Since traditional Mexican cultural attitudes regarding male drinking are less restrictive to begin with, no similar impact of acculturation would occur among Mexican American men.

In addition to ethnic differences in the prevalence of alcohol disorder, the effects of age on rates of abuse and dependence were different for Mexican Americans and non-Hispanic whites. Generally, surveys of various U.S. community populations have found lower levels of heavy drinking among the elderly (Noble 1978; Clark et al. 1981). Reported lifetime and current rates of alcohol disorders also have been lower among the elderly (Weissman et al. 1980; Robins et al. 1984; Myers et al. 1984). In the present study, the same lower prevalence of alcohol disorder among persons aged 50 years or over was found for non-Hispanics and for Mexican American women, but not for Mexican American men. One-third of Mexican American men over 50 years of age met criteria for an alcohol disorder—a rate almost double that for non-Hispanic white men. A number of likely explanations exist for declining rates of lifetime alcohol disorders among the elderly when a population is studied cross-sectionally. These explanations include increased incidence of alcohol disorder over time in the population; higher mortality among those with alcohol disorder, which leaves relatively fewer persons with alcohol disorder in the older age groups; or the tendency to forget alcohol problems that occurred in the distant past. The last two explanations would lead to underestimates of the proportion of persons affected by alcohol disorders in the older age cohorts. The finding that rates among Mexican American males over 50 years are not lower than those in younger age groups suggests that elderly Mexican American men may have special needs for treatment of alcohol problems. Caetano (1984*a*) also has presented data indicating that current drinking problems may be especially high among older Mexican American men.

Among persons who met the criteria for alcohol abuse or dependence, few ethnic differences were found in the type of alcohol diagnosis reported, in the number of alcohol problems experienced, or in the specific pattern of alcohol problems that had occurred. Mexican American women differed from other groups, however, in the duration of the disorder, with a later mean age of onset and shorter duration of alcohol problems than non-Hispanic white women. This finding may again reflect the greater cultural restraints on drinking placed upon Mexican American women compared with Anglo American women. However, the findings do not support the hypothesis of greater social impairment from alcohol use when social sanctions against alcoholism are strong. Instead, the data suggest that attitudes that discourage heavy alcohol drinking among Mexican American women may result in a relatively lower incidence of alcohol disorder and, among those who do develop an alcohol disorder, may delay the average age of onset. Unfortunately, any protection Mexican American women have from developing an alcohol disorder may diminish with increased exposure to Anglo American culture, as was seen in the increasing prevalence of alcohol disorders among Mexican American women with higher levels of education. The relation of acculturation and migration factors to prevalence of alcohol disorders will be explored in subsequent analyses of the LA-ECA data to provide a more thorough examination of this possibility.

In contrast to the few ethnic differences found in severity of alcohol disorder, sex differences in both ethnic groups were pronounced. Evidence suggests that men consumed greater quantities of alcohol in a day and had more social problems such as fights and arrests. Men also were less likely to have been advised by a professional that they were drinking too much or to feel that they had lost control of their drinking. Generally, this finding seems consistent with the idea that heavy drinking and disruptive behavior while drinking are socially more acceptable for men than for women. As a result, alcohol abuse and dependence are not only less common among women, but for women who do have alcohol disorders, attempts at self-control and control by others are more frequent.

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Prevalence of Alcohol Abuse and Dependence in Puerto Rico

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Abstract

A large-scale psychiatric epidemiologic study of a random sample of the Puerto Rican population aged 18-64 years was conducted using the National Institute of Mental Health Diagnostic Interview Schedule. Alcoholism was found to have a lifetime prevalence of 12.6 percent and a current (6 month) prevalence of 4.9 percent. Alcoholism also was found to be predominantly a male disorder, occurring 12 times more frequently in men than in women. Men appeared to be more severely affected in terms of earlier age of onset and a higher number of symptoms. In this paper, demographic and sociocultural correlates are discussed, and recommendations are made for further research on this major public health problem.

Introduction

Previous estimates of the prevalence of alcoholism in Puerto Rico have ranged from about 9 percent to 40 percent of the adult population, depending on the definition of the disorder used (Garcia 1976; Gonzalez 1983). As in other countries, prevalence estimates have been hindered by the absence of a consensus regarding criteria that define the syndrome. The same absence of consensus also has impeded comparison of the rate of the disorder among Puerto Ricans with rates among other populations–a critical area of study for one of the few disorders of which both etiology and cures are profoundly dependent upon social, economic, and cultural variables (Vaillant 1983).

The application of criteria defined by Feighner and colleagues (1972), in *Research Diagnostic Criteria* (RDC) (Spitzer et al. 1975) and, more recently, in the *Diagnostic and Statistical Manual of Mental Disorders* (DMS-III) (American Psychiatric Association 1980) has facilitated the effort to acquire comparable psychiatric epidemiologic data. For this purpose, the National Institute of Mental Health's (NIMH) Epidemiologic Catchment Area (ECA) program promoted the development of a structured interview, the Diagnostic Interview Schedule (DIS) (Robins et al. 1981). This interview, specifically designed to be administered by nonclinicians, leads to computer-generated diagnoses based on DMS-III, Feighner, or RDC criteria and contains a schedule for alcoholism that provides a diagnosis of alcohol abuse and/or alcohol dependence. Alcoholism is one of the diagnoses studied in the ECA program, which is designed to provide estimates of the rates of psychiatric disorders in five survey sites in the United States. Although Puerto Rico is not part of the ECA program, the Epidemiologic Study of Mental Disorders in Puerto Rico used the DIS in a large survey of the island's population. Use of the same diagnostic instrument and similarities in methodology allow comparison of prevalence estimates from this study with those obtained at ECA sites.

Review of Relevant Research

Indirect evidence suggests a high prevalence of alcoholism in Puerto Rico. Puerto Rico ranks among the 10 countries in the world with the highest per capita consumption of alcohol; approximately 2.22 gallons of ethyl alcohol and 1.95 gallons of distilled spirits per person were consumed in Puerto Rico during 1982-1983 (Puerto Rico Department of Treasury 1982-1983). Cirrhosis of the liver, the occurrence of which has been highly correlated with alcohol use, was the eighth leading cause of death in the general population in 1980 and the seventh leading cause in 1983. In 1980, cirrhosis was the third leading cause of death for persons aged 35 to 64 years and the leading cause of death due to disease for males aged 35 to 49 (Puerto Rico Department of Health 1982). During the same year, liver cirrhosis was four times more prevalent in men than in women. Based on death certificates mentioning hepatic cirrhosis, the proportion associated with alcoholism increased from 31.5 in 1981 to 32.6 in 1982 (Puerto Rico Department of Health 1982).

In addition, the rum industry remains an important source of revenue for the island, and rum commercials are frequently shown on television and in movie houses. Alcoholic beverages are sold in supermarkets and small businesses at relatively low prices. Puerto Rico has no blue laws, and despite the fact that current laws officially prohibit the sale of alcoholic beverages to people under the age of 18, enforcement is difficult. Sociocultural factors also appear involved. Heavy drinking often accompanies recreational activities, and a great deal of tolerance is displayed toward the drunkard as long as he does not engage in violent behavior (Aviles-Roig 1973; Garcia 1976).

Although such indirect measures and observations suggest heavy alcohol use, their value in assessing the prevalence of alcoholism is questionable (Miller and Agnew 1974; Duffy and Cohen 1978). For example, the death rate in Puerto Rico from hepatic cirrhosis may be inflated by the number of people suffering from schistosomiasis, a tropical disease that also affects the liver and increases vulnerability to cirrhosis. Per capita alcohol consumption figures also are confounded by a large number of tourists who take advantage of the island's low liquor prices. Thus, methods that directly study individuals and determine presence or absence of the disorder through well-defined operational criteria are essential to developing reliable estimates of the prevalence of alcoholism in Puerto Rico.

The only previous study in Puerto Rico that reported prevalence figures of alcoholism was conducted by Garcia (1976). Gonzalez (1983) also studied the patterns of alcohol consumption and alcohol-related problems. Both studies reported data on patterns of alcohol consumption for representative island-wide samples. However, the studies differed in their definitions of "drinking pattern." Gonzalez defined heavy, moderate, and occasional drinking by the number of drinks per week, month, or year. Garcia relied on the subject's interpretation of what these levels of drinking behavior meant. The studies also employed different methodologies. Garcia relied on information given by one family member regarding other family members. Gonzalez's data were based on direct interviews with the respondents, but were limited to reports of loss of control in drinking rather than encompassing other aspects of possible alcoholism.

Given these differences, it is not surprising that the results varied significantly. For example, Garcia obtained a prevalence of current alcoholism of 5.5 percent, whereas Gonzalez reported that 11.3 percent admitted to intoxication. Both studies, however, found significant sex differences in drinking patterns. Gonzalez reported that of the drinking population 15 years and older, approximately 30 percent were heavy drinkers; of these, 89 percent were males and 11 percent were females. Of the 11.8 percent who had lost control over drinking, 84 percent were males and 16 percent were females. Because of differences like these, few definitive conclusions regarding the prevalence of alcoholism in Puerto Rico can be drawn from these two studies.

Research related to the prevalence of alcoholism among mainland Puerto Ricans also has provided limited information. Most epidemiological studies have not been intended to define the prevalence of alcoholism per se, but rather to document patterns of drinking and associated problems (Nace 1984). Furthermore, as noted in Caetano's (1983) review of the literature, with few exceptions (Alcocer 1979; Jessor et al. 1968), the published surveys conducted in the United States to study the prevalence of alcohol patterns and problems have not been developed to study Hispanics. Consequently, the numbers of respondents identified in these surveys as Hispanic have constituted small proportions of the samples, making it impossible to estimate prevalence in that ethnic group with reasonable confidence. Furthermore, the Hispanic group characteristically has not been disaggregated into component national groups. Because all Hispanic groups are not alike, the aggregated data are of limited value. For example, Cahalan et al. (1969) identified a group of 24 Hispanics from a national sample of 2,746 household interviews and classified them as being of Latin American/Caribbean ancestry. The few studies in which the sample of Hispanics has been large enough to allow reasonable confidence in statistical analyses were conducted among Mexican Americans (Alcocer 1979; Jessor et al. 1968).

The majority of studies on alcohol patterns of smaller household samples also have involved Mexican American populations (Caetano 1983; Clark and Midanik 1981; Treiman et al. 1976). Haberman (1970) and Haberman and Scheinberg (1967) conducted household surveys of drinking patterns in which a large sample of mainland Puerto Ricans was studied. The authors reported that Puerto Ricans had one of the highest scores on what they termed "implicative drinking," i.e., alcohol-related problems associated with health, job, and family; excessive drinking; and personal reasons for drinking. Results of the study indicated that all problem drinkers were males and that Puerto Ricans had the highest female/male ratio of reported nondrinking of all ethnic groups studied. The proportion of abstainers among the Puerto Rican women was 74 percent in contrast to only 16 percent of the males.

The paucity of research related to the prevalence of alcoholism or alcohol-related problems for both mainland and island Puerto Ricans allows few conclusions to be drawn about the prevalence of this disorder. This study begins to fill this gap in knowledge of alcoholism among Puerto Ricans and will provide data for comparison with other ethnic groups in the United States. This is the first study conducted in Puerto Rico that reports on the lifetime and 6-month prevalence of the diagnosis of alcohol abuse and/or dependence according to DSM-III criteria. In addition, it is the only study in which the disorder is associated with major demographic variables and with the presence or absence of other psychiatric diagnoses.

Method

The NIMH Diagnostic Interview Schedule

The DIS is a diagnostic instrument that can be scored by clinicians or lay interviewers. The scored instrument is analyzed through computer algorithms that can make 25 psychiatric diagnoses based on Feighner, RDC, and DSM-III criteria (Robins et al. 1981). The algorithms allow these diagnoses to be made with or without hierarchical exclusions. Clinical judgment is reduced to a minimum by the DIS because the interviewer must score answers to specified questions without making psychiatric inferences.

This study reports the data on alcohol abuse and/or dependence as measured by the DIS according to DSM-III criteria only. According to these criteria, the diagnosis of alcohol abuse must include the following: (1) a pattern of pathological alcohol use, (2) impairment in social or occupational functioning due to alcohol use, and (3) duration of the disturbance for at least 1 month.

The diagnosis of alcohol dependence must include the following two criteria: (1) either of the patterns of pathological alcohol use or impairment in social or occupational functioning due to alcohol use defined above, and (2) either alcohol tolerance or withdrawal.

Thus, the diagnosis of alcohol abuse or dependence applies to any person who meets the DSM-III criteria described above for either the diagnosis of alcohol abuse, alcohol dependence, or both as measured by the DIS. To be classified in this study as a lifetime alcoholic, the respondent must meet a minimum of any two of the preceding criteria, but these criteria need not have overlapped in time. For example, a person may have had a pathologic pattern of alcohol use when young (e.g., weekend binges, without social consequences); if in later years the person was arrested for drunk driving, the individual is considered to have met the lifetime criteria.

Six-month prevalence was measured for subjects who met lifetime criteria and in whom one of the symptoms also occurred sometime during the previous 6 months. This subject was classified as "current" even if all the criteria for the syndrome of alcoholism were not met during the 6-month period. Thus, by "algorithmic" definition, lifetime prevalence exerted a powerful influence on the measurement of 6-month prevalence.

Sample Design and Characteristics

The Spanish translation of the DIS developed by Karno et al. (1983) was used for this study. Prior to the field survey, this translation was adapted for the Puerto Rican population, and the concurrent and procedural validity of the translated instrument was tested. The design and results of that study are documented elsewhere (Canino et al., in press).

Of relevance to this paper was the excellent agreement (kappa = .79) for the diagnosis of alcohol abuse and/or dependence when the DIS was administered by a psychiatrist and when it was administered by a lay interviewer. Agreement was similarly high when the DIS was administered by a lay interviewer and then was compared to the clinical judgment of two highly qualified native Puerto Rican psychiatrists (kappa = .73).

The Spanish DIS was administered to selected persons using a two-stage cluster probability sample of 2,036 households. The population surveyed included all persons aged 17-64 years usually living in the household, as well as household members temporarily away or institutionalized. Excluded from the sample were the homeless, transients, and those living in institutions without families in the community. Within each household designated by the two-stage probability sample, one respondent was selected at random using the Kish method (Kish 1949) from among those in the population of interest. Of the 2,036 households identified in the sample, 1,707 were judged to be eligible for inclusion because they had adults in the appropriate age range. In these eligible households, 1,551 interviews were completed–an exceptionally high completion rate

Table 1.–Puerto Rican adult psychiatric epidemiology study sample and population demographic characteristics (1980 U.S. census figures)

	Population		Unweighted sample		Weighted sample[a]	
	N	Percent	N	Percent	N	Percent
Total						
17-64 years	1,792,127	100.0	1,552	100.0	1,792,099	100.0
Sex						
Female	941,319	52.5	876	56.4	941,320	52.5
Male	850,808	47.5	676	43.6	850,779	47.5
Age						
17	69,175	3.9	38	2.5	69,175	3.9
18-24	397,839	22.2	295	19.0	397,839	22.2
25-34	465,898	26.0	431	27.8	465,870	26.0
35-44	359,936	20.1	338	21.8	359,937	20.1
45-54	274,806	15.3	210	13.5	274,805	15.3
55-64	224,473	12.5	240	15.5	224,473	12.5
Area of residence						
Urban	1,226,375	68.4	1,018	65.6	1,139,957	63.6
Rural	565,752	31.6	534	34.4	652,142	36.4
Educational level (years)[b]						
0-6	449,512	25.1	341	22.0	364,042	20.3
7-9	305,373	17.0	261	16.8	283,673	15.8
10-12	651,354	36.4	528	34.0	627,014	35.0
13-15	227,191	12.7	227	14.6	294,909	16.5
16+	157,767	8.8	194	12.5	221,412	12.4

[a] The number of people classified by education does not sum to the total weighted sample due to missing values.

[b] Data on educational level are U.S. census estimates based on a sample of households (U.S. Bureau of Census 1980) and therefore do not sum to the total population figures.

of 91 percent. Thus, the likelihood that persons with pathological alcohol use were missed due to nonresponse was substantially lower than in previous large-scale epidemiologic studies.

Demographic characteristics of the unweighted sample were similar to those of the Puerto Rican population described by the 1980 census (table 1). The sample was weighted to correct for nonresponse, to adjust for household probability selection due to varying sizes of households, and to generate age and sex distributions matching those reported by the Puerto Rico Census Bureau. The weighting process, however, led to marginal overrepresentation of the rural population and to slight underrepresentation of the less educated. A comparison of the general population with the weighted sample indicates that the difference was no more than 5 percentage points in any category.

The data were subjected to extensive quality control measures to ensure accuracy. The techniques used to measure and control sources of error were similar to those used in the ECA sites (Eaton et al. 1984). Among these measures were careful sampling, standard instrument presentation, extensive interviewer training, manual interview review, and automated data cleaning procedures.

Because the field study employed a two-stage sampling design rather than simple random sampling, usual estimators of variance could not be used. Specialized statistical software (Hidiroglou et al. 1980) using the Taylor series linear approximation of variance estimates was employed to estimate prevalence rates, regression coefficients, and their respective standard errors.

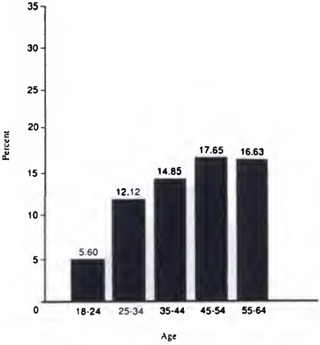
Results

Lifetime Prevalence

The lifetime prevalence of DSM-III alcohol abuse and/or dependence in Puerto Rico was found to be approximately 13 percent. Alcoholics were classified as abusers only (4.4 percent), dependent only (1.2 percent), or both (7 percent). Alcoholism was shown to be an overwhelmingly male disorder: 24.6 percent of the men were classified as lifetime alcoholics, compared with only 2 percent of the women.

Lifetime prevalence of alcoholism appeared to increase with age (figure 1). The highest rate (17.6 percent) was for the 45-54 age group. Beyond this age, slightly lower prevalence was found, but the difference between the 55-64 and the 45-54 age groups was not statistically significant. Although the tendency for lifetime prevalence to increase with age was more apparent in men than in women, the sample of women with alcoholism was too small to draw a definite conclusion.

Figure 1. Lifetime prevalence of alcoholism in a Puerto Rican sample by age



The prevalence of alcoholism was found to be somewhat higher in urban than in rural areas, but the difference was not statistically significant.

Education, considered as a continuous variable, did not appear to influence the prevalence of alcoholism. However, when the population was divided into those with and without some college education, there was a tendency for a lower prevalence of alcoholism among those with more education.

Two multivariate regression analyses were performed. In the first, the dependent variable was the presence or absence of alcohol abuse/dependence, and in the second, the number of symptoms of alcoholism in the total population. The second analysis was a proxy of the prevalence of alcoholism and was used to deal with the limitations inherent in a binary dependent variable. In both analyses, the independent variables included age, sex, and education.

Results of these analyses were similar. Alcoholism was found to increase with age and to be more prevalent among men. Education was not a significant factor in the first regression analysis after controlling for age and sex, but was significant in the second analysis at the .05 level. This finding may be explained by the relationship between total number of symptoms and education among alcoholics.

Six-Month (Current) Prevalence

Six-month prevalence of DSM-III alcohol abuse/dependence was determined to be 4.9 percent. Its demographic correlates were similar to those of lifetime prevalence. Male predominance of the diagnosis also was apparent in 6-month prevalence: 10 percent of the men were classified as alcoholic compared with 0.5 percent of the women. The level of education did not appear to influence 6-month prevalence of alcoholism, and although current prevalence showed a tendency to increase with age, the difference was not statistically significant.

Since employment and marital status refer to current situations, these variables were analyzed according to 6-month prevalence. The prevalence of alcoholism was found to be higher among the unemployed (10.1 percent) than the employed (5.8 percent). Although there was an apparent difference between the prevalence among those not in the labor force and among those employed, this difference may have been due to the number of housewives in the "not in the labor force" category. The prevalence of alcoholism among employed men was the same as that among those not in the labor force–approximately 9 percent. The "not in the labor force" category included students, a category more similar to those employed than to those unemployed. The prevalence rate of alcoholism did not vary with marital status either in lifetime or 6-month prevalence.

Comparison Between Puerto Rico and ECA Sites According to Age

The prevalence of the DIS/DSM-III diagnosis of alcoholism by age of the respondents appears to differ according to geographic location. In the ECA sites, lifetime and 6-month prevalence have been shown to peak in the 25-44 age group and to decrease thereafter, whereas, in the Puerto Rican sample, the prevalence of alcoholism continued to increase with age.

In both Puerto Rico and the ECA sites, the cohort effect of age prevailed in estimates of prevalence. In Puerto Rico, where the lifetime prevalence increased with age, the 6-month prevalence showed the same pattern, although less markedly (figure 3). In the ECA sites where the lifetime prevalence decreased in the 45-64 age group, the 6-month prevalence also decreased.

Figure 2. Lifetime prevalence of alcoholism by age in four geographic areas

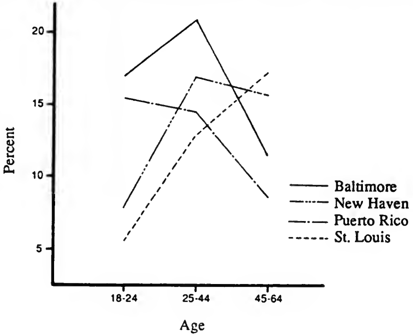
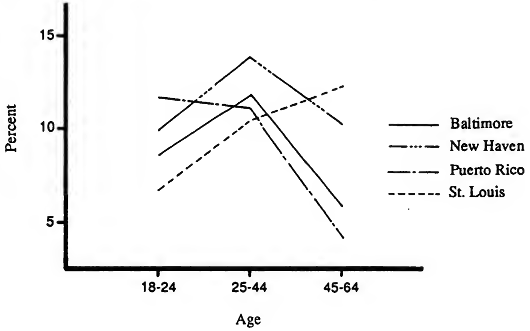


Figure 3. 6-month prevalence of alcoholism by age in four geographic areas: males only



Description of the Alcoholic Cohort

The average age of onset of the first alcohol symptom among the Puerto Rican population was determined to be 26 years. As expected, because new cases were added at each age level, the average age of onset rose with cohort age. The mean age of onset of the younger group was 17 years, whereas for those in the older age groups, the mean ages were 25 and 31 years, respectively. No significant difference was found in the age at which the first alcohol symptom appeared between the subjects from urban and rural areas or between those with more and less education.

To examine the impact of the definition of alcoholism used in this analysis on the prevalence rate and demographic findings, the total number of symptoms among alcoholics was reviewed. The mean number of symptoms among alcoholics was 5.71, well above the threshold of two symptoms. The average number of symptoms was higher for alcoholic men than for women (5.9 versus 4.2), but in both cases the mean number of symptoms were above the threshold. Of those people classified as alcoholics, 15 percent were threshold cases with only a minimum of two symptoms. A narrower definition of alcoholism probably would have excluded them.

The mean number of symptoms among alcoholics did not vary significantly between urban and rural areas, between young and old, or between the more and the less educated. In all classifications it was well above the threshold, averaging approximately five symptoms. A multivariate regression analysis of the alcoholic population with the total number of symptoms as the dependent variable and age, sex, and education as independent variables showed that alcoholic men tended to have more symptoms than alcoholic women. The number of symptoms diminished with education. Age was shown to be a poor predictor of the number of alcohol symptoms among alcoholics.

These analyses tended to confirm the hypothesis that the geographic and age distribution of alcoholics would not change if stricter criteria (i.e., more symptoms required) were used for defining alcoholism. However, there would be a higher percentage of men and a lower percentage of the more educated among alcoholics if stricter criteria were used.

Alcohol-Related Symptoms of Nonalcoholics and Alcoholics

The percentages of positive responses to DIS lifetime alcohol abuse and/or dependence questions for alcoholics and nonalcoholics are shown in table 2. The questions are arranged to correspond to the three DSM-III criteria necessary to meet the diagnostic threshold for alcohol abuse and/or dependence.

Responses to items related to the DSM-III criterion of pathological alcohol use indicated a possibly high consumption rate of liquor by nonalcoholics. Almost 10 percent of the nonalcoholic population admitted to having experienced blackouts, and 7 percent admitted to having drunk a fifth of liquor in 1 day. Almost one-fourth (23.8 percent) of alcoholics admitted to continued drinking despite serious physical illness.

Alcoholics in the Puerto Rican sample did not appear to have encountered many social consequences related to their alcohol use. With the exception of objections by families (75.7 percent) and friends (50 percent), social consequences related to alcohol use for alcoholics had been experienced by relatively small percentages of the sample: Job loss (7 percent), job troubles (15 percent), trouble related to driving while drinking (21 percent), and arrests secondary to drinking (13 percent).

Discussion

On the basis of both lifetime and 6-month prevalence rates, alcohol abuse and/or dependence was one of the most common of the mental disorders identified in Puerto Rico. This finding was not entirely unexpected when viewed in the light of prior research. Epidemiologic surveys, prevailing sociocultural attitudes, and various indirect measures suggest a high prevalence of alcoholism. Puerto Rico has a high per capita consumption of distilled spirits, a high alcohol-related death rate, and low prices and easy accessibility to alcohol–all factors previously associated with a high prevalence of alcoholism (Noble 1978; Smart 1976; Vaillant 1983).

Nevertheless, one might argue that the high prevalence rate of alcoholism in Puerto Rico identified by this study is an artifact of the low diagnostic threshold necessary to meet DSM-III criteria. However, the mean number of alcohol-related symptoms for those with a lifetime diagnosis was found to be 5.7, well above the two symptoms required for a diagnosis of alcoholism. Therefore, it seems unlikely that borderline cases inflated the final prevalence figure. On the other hand, if a more stringent definition of alcoholism had been applied (i.e., more symptoms required to make the diagnosis), the difference between the sexes and between educational levels would have increased, since the average number of symptoms was lower among women and the better educated.

Sex differences in lifetime and 6-month prevalence rates of alcoholism in Puerto Rico were found to differ from those reported in three U.S. cities (St. Louis, Baltimore, and New Haven) (Robins et al. 1984; Myers at al. 1984). In general, alcoholism is predominantly a male disorder. However, in Puerto Rico the male/female ratio for this disorder appears to be higher than in the other U.S. sites. The finding of a higher male/female prevalence of alcoholism among Hispanics as compared with Anglos was not surprising and, indeed, has been demonstrated in previous studies. More recently, Burnam (in this volume) also reported significantly higher male/female prevalence rates for Mexican Americans as compared with non-Hispanic whites from Los Angeles.

The alcohol abuse/dependence syndrome also appears to be more severe in males than in females. This was suggested in the present study by a higher mean number of symptoms in male alcoholics (six) than in female alcoholics (four). Thus, female alcoholism appears less severe as well as less common. Some caution is warranted in the interpretation and the conclusions drawn from these results, however, since social disapproval of alcohol use in women may lead to an underreporting of symptoms, thus affecting both prevalence and severity measures.

Lifetime Prevalence

A difference was found between the Puerto Rican sample and the ECA sites in the relationship of lifetime prevalence of alcoholism and age. In the Puerto Rican sample, lifetime prevalence increased with age until it reached a disturbing 33 percent in the 45-64 age group. In contrast, the lifetime prevalence in the ECA sites peaked in the 25-44 age group and declined in the 45-64 age group. The decline continued in the over-65 group (Helzer et al. 1985), for which comparable data were not available in Puerto Rico.

Recently, the Los Angeles ECA site reported a lower lifetime prevalence rate for alcohol abuse/dependence among non-Hispanic white men over the age of 50. However, among Mexican American males, the lifetime prevalence rate of alcoholism was reported to increase after age 50 to a rate almost double that for non-Hispanic white men. These findings are similar to those of Burnam's Hispanic sample (in this volume), suggesting that the relationship between age and lifetime prevalence of alcohol abuse and/or dependence may be explained by cultural factors common to both Hispanic groups.

The findings of this study and those of Burnam (in this volume) also are consistent with what one would expect for a condition in which new cases can be added

Table 2.–Positive responses to DIS/DSM-III alcohol abuse/dependence items among nonalcoholics and alcoholics in Puerto Rico (18-64 years)

Description	Nonalcoholics[a] (percent)	Alcoholics (percent)
A Criterion: Pathological alcohol use		
One fifth of liquor in 1 day	7.0	82.7
Inability to stop	.6	28.3
Attempts to control	.9	22.8
Two or more binges > 2 days	0	24.8
Blackouts	9.9	59.0
Continued drinking despite serious physical illness	0	23.8
Need daily drinking to function	0	13.0
B Criterion: Social consequences of alcohol use		
Family objects	3.8	75.7
Friends/professional said drinking too much	.8	49.9
Job troubles	0	14.9
Job loss	0	7.3
Trouble driving while drinking	.9	21.2
Arrests secondary to drinking	.6	13.3
Fights secondary to drinking	1.0	39.5
C Criterion: Tolerance or withdrawal		
Two-week period of ≥ 7 drinks daily	.6	44.4
Morning drinking	.2	19.1
Withdrawal shakes	0	28.1
Items not included in criteria		
Thought self excessive drinker	1.1	49.9
Two-month period of ≥ 7 drinks once/week	5.8	79.3
Total medical doctor	.2	16.7
Period of binges > 2 days	0	29.8
Neglects responsibilities during binges	0	46.6
Fits or seizures	0	.8
Delirium tremens	0	3.5
Hallucinations	0	.4

[a] Nonalcoholics do not include lifetime abstainers (21.7 percent of the sample).

at any age. In trying to explain the decrease of prevalence with age, Robins et al. (1984) cited the following possibilities: (1) faulty recall in the older group, (2) selective mortality (i.e., alcoholics die at a higher rate and at a younger age), and (3) a cohort effect (i.e., a true increase in the condition in the younger age groups).

Conceivable explanations for the increase of prevalence with age include the possibility that alcoholism may be a milder condition in Puerto Rico, so that more alcoholics survive to an older age. Negrete (1980) has postulated that in societies with permissive social attitudes toward alcoholism, alcoholics are less disabled by alcohol use. Second, there is the possibility that symptomatic drinking may have begun at a later age, and thus the full effects of selective mortality were not seen in the oldest age group (45-64 years) studied here. This explanation is supported by the fact that 29 percent of the St. Louis male population aged 18-24 years met the criteria for lifetime alcoholism (Robins et al.

1984), whereas only 10.7 percent of this same age group in Puerto Rico met the criteria. The average age of first symptom in this age bracket for both groups was 17 years. Although both populations showed an increase in prevalence in the 25-44 age group, the prevalence in Puerto Rico was considerably lower (26.2 percent) than the prevalence in St. Louis (37.5 percent). The age of first symptom in the 25-44 age group also differed: 22 years in St. Louis (Helzer et al. 1985) and 26.5 years in Puerto Rico. Again, this difference may indicate that symptomatic drinking began at a later age in the Puerto Rican sample. The third possible explanation relates to a cohort effect; that is, a trend of increasing alcoholism in younger age groups in the United States may not be occurring in Puerto Rico. However, the similarity of findings between the Puerto Rican sample and the Hispanic sample of Los Angeles suggests that cultural factors may be a more reasonable explanation for the differences in the age and lifetime prevalence distributions found in Puerto Rico and in the ECA sites.

Six-Month (Current) Prevalence

The overall 6-month prevalence of DIS/DSM-III alcohol abuse and/or dependence in the Puerto Rican sample was found to be similar to the rates obtained in the ECA sites. Each site had a 6-month prevalence age distribution pattern similar to that of lifetime prevalence. In the ECA sites, both 6-month and lifetime prevalence rates declined after age 45. In Puerto Rico, both rates failed to decline. It is suggested that these results are explained largely by the effect of lifetime prevalence on the measurement of 6-month prevalence.

In addition, cultural factors also may have played a role in the slight tendency of 6-month prevalence to increase with age. For example, there is some evidence that Puerto Ricans are more involved in close kinship networks than their North American counterparts. Such involvement may provide a buffer against the social consequences of alcoholism (Rodriguez et al. 1978; Robles et al. 1980; Bird and Canino 1982; Aviles-Roig 1973) and, in effect, may encourage continued excessive use of alcohol and simultaneously protect against early deterioration. However, these hypotheses require further testing.

Although the objections to the alcoholic's drinking by family and friends were relatively high in the Puerto Rican sample, they were considerably lower than those reported in Anglo and Hispanic samples from Los Angeles (Burnam, in this volume). Other social consequences of drinking, such as troubles on the job and alcohol-related arrests, also were lower for Puerto Ricans living on the island. Several studies have shown that Hispanics (Puerto Ricans or Mexican Americans) in the United States suffer more social consequences of alcoholism (e.g., job loss, arrests, and family objections) than Puerto Ricans in Puerto Rico (Haberman 1970; Caetano 1983, 1984; Cahalan 1970; Cahalan and Cisin 1975; Cahalan and Treiman 1976; Hyman et al. 1972). Those less severe social consequences may foster continued symptomatic drinking in Puerto Rico and thus partly explain the increasing prevalence rates for the 45-64 age group.

Permissive social attitudes toward heavy drinking also were suggested by findings in the nonalcoholic portion of the sample. Even among this group, 10 percent admitted to blackouts and 7 percent to drinking a fifth of liquor or more in a single day.

Conclusions

Findings of this large-scale epidemiologic study indicate that alcoholism is a highly prevalent disorder in the Puerto Rican population, particularly among men. The design of the study, the nature of the sample, and the unusually high response rate permit confident projections to the general population of Puerto Rico. Thus, the number of persons aged 18-64 years who meet criteria for current alcohol abuse/dependence in Puerto Rico may be near 100,000. Because its associated morbidity and mortality are high, alcoholism is probably the most important mental health problem in Puerto Rico.

Accurate delineation of the scope of the problem is the first step towards a solution. Planned future research will address the evolution of the illness over time. A need exists for genetic family studies, studies of the impact of treatment, and studies of sociocultural factors relating to the evolution of the condition. Ultimately, the measures necessary for the prevention of this serious public health problem will be delineated.

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Alcohol Use and Homicide Victimization: An Examination of Racial/Ethnic Differences

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Abstract

Alcohol use may play an important causal role in homicide. However, information characterizing the association between alcohol use and homicide victimization within specific racial/ethnic groups is limited. To characterize the relationship, data from the Los Angeles City Police Department and the Los Angeles Medical Examiner's Office were used to study victims of criminal homicides in Los Angeles during the period 1970-1979. Alcohol was detected in the blood of 1,733 (49 percent) of the 3,551 victims aged 15 to 64 who were tested. In 32 percent of those cases tested, the blood alcohol level was $\geq$ 100 mg/100 ml, the level of legal intoxication in most States. Blood alcohol was present in 39 percent of white, 49 percent of black, and 59 percent of Hispanic victims of homicide. Presence of blood alcohol among racial and ethnic groups also differed according to situational variables, including the day of the week the homicide occurred and relationship between the victim and offender. These variations emphasize the need to examine situational, socioeconomic, and cultural factors in explaining racial and ethnic differences in alcohol use patterns among homicide victims.

Introduction

A strong association is presumed to exist between alcohol use and homicide victimization. Without exception, however, these findings have been restricted to homicide victims in two racial groups–whites and blacks (Wolfgang 1958; Voss and Hepburn 1968). Moreover, these findings have been based on the history of alcohol use, a method of measurement subject to potentially greater biases than biochemical testing. Because homicide is now recognized as a major cause of premature mortality in the United States, particularly among racial and ethnic minority groups, recent public health initiatives have emphasized the need to define better the role of alcohol as a risk factor for homicide victimization and other types of interpersonal violence (U.S. Public Health Service 1980).

Our basis for considering an association between alcohol use and homicide victimization derives from previous studies that have been restricted primarily to homicide victimization. Alcohol use may relate to an increased risk of homicide victimization in several ways (Wolfgang 1958; Voss and Hepburn 1968; Wolfgang and Strohm 1956; Boyatzis 1975; Taylor and Gammon 1975; Bennett et al. 1969; Katkin et al. 1970; Zeichner and Pihl 1980). Alcohol may increase the likelihood of risk-taking and provocative behavior by some potential victims; this behavior, in turn, may lead to violent interaction and homicide. Wolfgang (1958) originally advanced the concept that such homicides may be precipitated by the victim. This hypothesis is consistent with the known physiological action of alcohol that, as a central nervous system depressant, may release inhibitory control mechanisms and thereby permit inappropriate expression of aggressive or violent behavior

(Bennett et al. 1969). Alternatively, individuals who are intoxicated may be easier targets for robberies and other predatory crimes that may end in homicide. Clinical and experimental research have addressed the questions of whether alcohol use increases risk-taking behavior, whether behavioral effects of alcohol are modulated by the presence of congeners, and whether alcohol use and instigator intent are important in shaping aggressive behavior (Taylor et al. 1976; Bennett et al. 1969; Katkin et al. 1970). Experimental data concerning the hypothetical role played by alcohol, however, are still inconclusive.

A consistent theme in homicide research has been the need to understand the contribution of socioeconomic status and cultural factors to racial and ethnic differences in the risk of victimization–factors that also have been hypothesized to be important determinants of alcohol consumption (Loftin and Hill 1974; Parker and Smith 1979; Smith and Parker 1980; Parker and Loftin 1983; Williams 1984; Wolfgang and Zahn 1979; Curtis 1975; Messner 1982; Wolfgang and Ferracuti 1967; Schaefer 1982; King 1982). An examination of differences in the association of alcohol use with homicide victimization across racial and ethnic groups may be useful in further exploring hypotheses concerning both the relationship between alcohol use and homicide and reasons for the elevated risk of homicide victimization faced by specific racial and ethnic groups.

Most studies of the relationship between alcohol use and homicide have been subject to a variety of methodological constraints (Voss and Hepburn 1968; Haberman and Baden 1978; Constantino et al. 1977; le Roux and Smith 1964; Centers for Disease Control 1984; Shupe 1954; Tinklenberg 1973; Roizen 1982). Many studies have been limited by their reliance on a history of alcohol use by victims and offenders prior to the homicide. Such historical accounts, given by a variety of informants, represent, at best, only a crude proxy for the level of blood alcohol at the time of the homicide (Fine et al. 1978); this limits the interpretation of findings as they relate to biologic and behavioral effects of alcohol on homicide occurrence. A second limitation of most previous studies has been the small number of demographic and situational variables recorded. Third, many of the previous reports about alcohol and homicide are based on studies of restricted, nonrepresentative samples of victims rather than on large population-based samples (Roizen 1982).

This paper reports results of a study of blood alcohol levels detected in homicide victims in Los Angeles between 1970 and 1979. It provides a unique opportunity to examine blood alcohol levels in homicide victims in different racial and ethnic groups in relation to demographic characteristics of these victims (i.e., age and gender) and to situational variables across the groups.

Background and Methodology

Data regarding alcohol levels in homicide victims were collected as part of a study of all homicides that occurred in the city of Los Angeles from 1970 through 1979 (Centers for Disease Control 1985). This 10-year period witnessed a total of 4,950 criminal homicides (i.e., death caused by injuries inflicted illegally by another person with intent to injure or kill, by any means). The average crude annual rate of homicide for Los Angeles for this period was 17.1 per 100,000 population. Rates increased by 84 percent over the decade, however, from 12.5 per 100,000 in 1970 to 23.0 per 100,000 population in 1979. Homicide rates varied dramatically among different sex, age, and racial and ethnic groups. Rates were higher among males (27.0 per 100,000), among persons 25 to 34 years old (26.9 per 100,000), and among blacks (45.6 per 100,000).

Demographic characteristics of victims and perpetrators and details about the homicides were obtained from confidential police files (Centers for Disease Control 1985). In this study, Hispanics were defined as persons of Spanish origin; in Los Angeles, this group includes Mexican Americans and a substantial number of immigrants from Central America and other locations. Anglos were defined as non-Hispanic persons who are white. Blacks were defined as non-Hispanic persons who are black.

Situational characteristics have been defined previously as factors that describe a person's engagement with an array of other persons, objects, or actions over a period of time (Pervin 1978). In this study, situational characteristics include the day of the week on which the homicide occurred and the relationships between persons involved in the homicide.

Results of toxicologic analyses performed during autopsies of homicide victims were abstracted from files of the Los Angeles Medical Examiner-Coroner and linked to the data obtained from the police files. During the period 1970-1979, autopsies were routinely done on all homicide victims in Los Angeles. As part of the autopsy, blood samples usually were first screened with permanganate and then analyzed by gas chromotography to assay and quantify alcohol levels (County of Los Angeles 1984; J. Choi, M.D., personal communication, June 5, 1984).

Results

Testing blood samples for alcohol levels was completed for 4,092 (82.7 percent) of the 4,950 victims. When examined by sex or by race/ethnicity, the proportion of victims tested was comparable among subgroups; however, test status varied markedly by age group (table 1). Testing was performed on 49.8 percent of victims under 15 years of age and 74.8 percent of those over 65 years old, as compared with 88.1 percent of those aged 15 to 65. Because victims under age 15 years old and over 65 years old were substantially less likely to be tested, interpretation of test results for these age groups may be constrained by selection bias. Therefore, this analysis is limited to the 3,551 victims between the ages of 15 and 64.

Alcohol was detected in 1,733 (48.9 percent) of the victims tested; levels ranged from 1 mg percent (1 mg per 100 ml) to 870 mg percent. In 16.6 percent of the victims, levels were 1-99 mg percent; however, in 32.2 percent of the victims, blood levels were $\geq$ 100 mg percent, the level of legal intoxication in most States. Male homicide victims were almost twice as likely as female homicide victims to have detectable alcohol levels in their blood (table 2). Levels of $\geq$ 100 mg percent were detected in 35.7 percent of males and in 17.3 percent of females. Approximately half of all victims in the 25 to 64 age group showed evidence of alcohol use before they were murdered; more than a third had alcohol concentrations $\geq$ 100 mg percent (table 3).

Blood alcohol levels varied markedly by race and ethnicity. Hispanic victims as a group had the highest proportions of detectable alcohol. Alcohol was detected in 58.5 percent of all Hispanic victims, compared with 49.1 percent of blacks, 39.1 percent of Anglos, and 38.2 percent of persons in other racial and ethnic groups (table 4). Levels were $\geq$ 100 mg percent in 39.3 percent of Hispanics, 32.9 percent of blacks, 23.8 percent of Anglos, and 27.6 percent of victims in other racial and ethnic groups.

Alcohol levels also were examined in relation to age and racial and ethnic groupings in males. The proportions of victims with any detectable level of alcohol or with levels $\geq$ 100 mg percent were lowest among Anglos (figures 1 and 2). Alcohol was present in more than half of the black males 25 to 64 years of age. In general, proportions were highest among Hispanics: In the 25-34 age group, 70.4 percent of victims had used alcohol, and in the 15-24 age group, a substantially higher proportion of Hispanic males (58.6 percent) showed evidence of alcohol use when compared with Anglos (38.8 percent) and blacks (42.0 percent) (figure 1). Among female victims, the proportion with any detectable level of alcohol also varied by racial/ethnic group: 19.4 percent in Hispanics, 23.2 percent in Anglos, and 29.1 percent in blacks.

Overall, alcohol was detected in markedly greater proportions of persons killed on weekend days than on midweek days (table 5). Although alcohol was detected most commonly in Hispanics on most days, patterns did vary by specific racial and ethnic group: Alcohol was detected most commonly in Anglos on Fridays (51.7 percent), in blacks on Saturdays (62.6 percent), and in Hispanics on Sundays (70.6 percent). Evaluation of data on only male victims reflects the general patterns, since males account for the majority of homicides (figure 3); however, proportions of victims in whom alcohol was detected were higher for each racial and ethnic group once the effect of females was removed.

The presence of alcohol in homicide victims appeared to be associated with the nature of the relationship between the victim and the suspect. When the suspect was a stranger, alcohol was present in only 41.8 percent of victims. However, when the suspect was known to the victim, alcohol was detected in 42.4 to 53.5 percent of the victims (table 6). Within each relationship category, alcohol presence varied by racial and ethnic group. Although alcohol was detected most commonly in Hispanic victims for most categories, one exception was notable: When the victim was killed by a spouse, only 22.2 percent of Hispanics were found to have used alcohol, in contrast to 41.5 percent of Anglo and 53.8 percent of black victims (table 6). Racial and ethnic differences also were prominent when the victim was killed by a stranger: Alcohol was present least commonly in Anglo victims (25.1 percent) and most often among Hispanics (57.1 percent). The proportions of victims in whom alcohol was detected also tended to increase when evaluation was restricted to males (figure 4). These results also indicate that among Hispanic males who were killed by their spouses, the likelihood of the presence of alcohol was much greater than that for Hispanic females killed by their spouses.

Table 1.—Characteristics of homicide victims tested and not tested for blood alcohol, Los Angeles, California, 1970-1979[a]

Characteristic	Test status: Tested N	Tested Percent	Not tested N	Not tested Percent	Total N	Total Percent
Sex						
Male	3,159	85.9	517	14.1	3,676	100.0
Female	853	81.9	189	18.1	1,042	100.0
Unknown	80	86.9	12	13.1	92	100.0
Race/ethnicity						
Anglo	1,027	82.0	225	18.0	1,252	100.0
Hispanic	911	85.7	152	14.3	1,063	100.0
Black	1,914	86.6	297	13.4	2,211	100.0
Other	98	81.0	23	19.0	121	100.0
Unknown	142	87.1	21	12.9	163	100.0
Age (years)						
0-14	125	49.8	126	50.2	251	100.0
15-64	3,551	88.1	481	11.9	4,032	100.0
65+	261	74.8	88	25.2	349	100.0
Unknown	155	87.1	23	12.9	178	100.0

[a] Excludes 140 victims for whom test status was unknown.

Table 2.—Blood alcohol levels in homicide victims aged 15-64 years by sex of victim, Los Angeles, California, 1970-1979[a]

Blood alcohol level (mg percent)	Male N	Male Percent	Female N	Female Percent
0	1,339	46.6	477	71.1
1-99	509	17.7	78	11.6
100+	1,027	35.7	116	17.3
Total	2,875	100.0	671	100.0

[a] Excludes 10 homicides for which there were no data on sex of victim.

Table 3.—Blood alcohol levels in homicide victims by age of victim, Los Angeles, California, 1970-1979

Blood alcohol level (mg percent)	Age of victim (years)									
	15-24		25-34		35-44		45-54		55-64	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
0	655	57.4	534	48.7	288	46.8	214	47.8	127	50.8
1-99	221	19.4	194	17.7	75	12.2	57	12.7	41	16.4
100+	265	23.2	369	33.6	252	41.0	177	39.5	82	32.8
Total	1,141	100.0	1,097	100.0	615	100.0	448	100.0	250	100.0

Table 4.–Blood alcohol levels in homicide victims aged 15-64 years by race/ethnicity of victim, Los Angeles, California, 1970-1979[a]

Blood alcohol level (mg percent)	Anglo N	Anglo Percent	Black N	Black Percent	Hispanic N	Hispanic Percent	Other N	Other Percent
0	503	60.9	917	50.9	348	41.5	47	61.8
1-99	126	15.2	292	16.2	161	19.2	8	10.5
100+	197	23.9	592	32.9	329	39.3	21	27.6
Total	826	100.0	1,801	100.0	838	100.0	76	100.0

[a] Excludes 10 homicides for which there were no data on race/ethnicity of victim.

Discussion

This study offers several advantages over previous research in assessing relationships between alcohol use and homicide in different racial and ethnic groups. First, all the homicides investigated by law enforcement authorities that occurred in an age-defined, culturally heterogeneous community during an extended time period were examined. Second, results were based on laboratory testing for alcohol presence and linked to the data file of each victim; this file included information about victims, suspects, and details of the homicide itself. Finally, this study allowed for the examination of alcohol use in homicide victims of minority groups, including Hispanics and blacks, and the comparison of findings directly with those of Anglos. It is believed that no previous studies have examined alcohol presence in Hispanic homicide victims.

The results of this study indicate that alcohol consumption was common among Anglo, black, and Hispanic homicide victims in Los Angeles. Moreover, because rigorous criteria specifying duration between time of injury and death were not used to exclude victims, the results probably underestimate the proportion of cases in which alcohol was present at the time of the homicide. Patterns of alcohol use by homicide victims varied markedly according to their demographic characteristics. In general, these variations reflected patterns of alcohol consumption that previously have been reported for different population subgroups (Miller et al. 1983; Harford and Mills 1978; Clark and Midanik 1982; Rachal et al. 1982; Malin et al. 1982; Alcocer 1982). Most striking was the evidence of alcohol use among male Hispanic victims. When compared with Anglo and black males, the high proportion of Hispanic decedents who used alcohol prior to death suggests that the association between alcohol and homicide may be a problem among this population that warrants special attention (Alcocer 1982).

Results from the present study should be compared with those of previous studies only with caution because of differences in the demographic and cultural composition of the communities studied, limitations in the numbers of homicides examined, differences in the methods of determining alcohol use, geographic variations in alcohol consumption, and the effect of secular trends of alcohol use in the population. Despite these caveats, similarities are found between some of the previous findings and those presented here.

Wolfgang evaluated the history of alcohol use by both homicide victims and offenders in Philadelphia and found that alcohol use before the homicide had been reported for 53 percent of the victims and 54 percent of the offenders (Wolfgang 1958; Wolfgang and Strohm 1956). Moreover, in nearly 44 percent of all homicides, alcohol use had been reported for both the victim and offender. In addition, Wolfgang found that a history of alcohol use (by victim or offender) was reported in 70 percent of homicides with black male victims versus 50 percent for homicides with white male victims. Voss and Hepburn (1968) examined police homicide records in Chicago and reported findings comparable to those of Wolfgang. A history of alcohol use was associated with 54 percent of all homicides and again varied by race and sex of the victim: Alcohol use was reported in 54 percent of homicides with nonwhite male victims versus 46 percent with white male victims and in 61 percent of nonwhite female victims and 47 percent of white female victims.

The limited data on biochemical testing for alcohol presence have been generally consistent with the findings reported by Wolfgang for history of alcohol use (Haberman and Baden 1978; Constantino et al.

Figure 1. Blood alcohol detected at any level in male homicide victims by race/ethnicity and age group, Los Angeles, California, 1970-1979

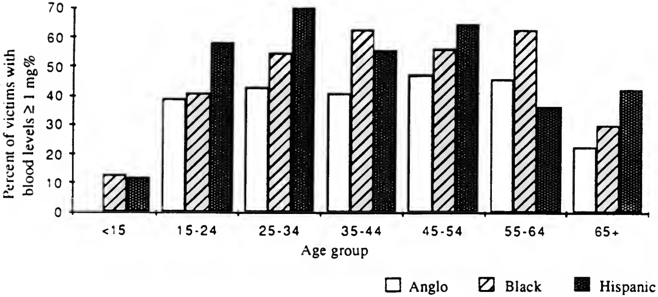


Figure 2. Blood alcohol levels ≥ 100 mg% in male homicide victims by race/ethnicity and age group, Los Angeles, California, 1970-1979

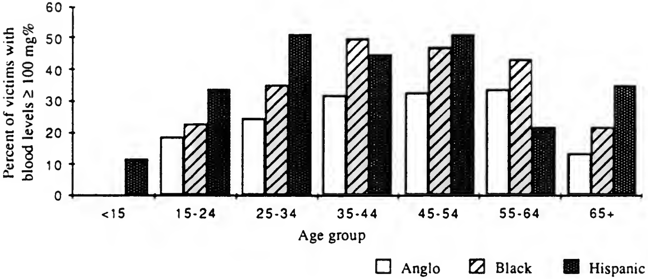


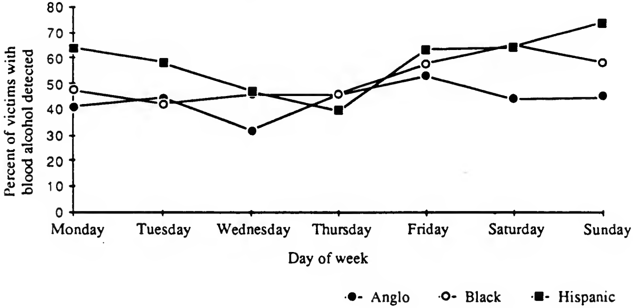
Table 5.—Blood alcohol detected in homicide victims aged 15-64 years by race/ethnicity and day of week homicide occurred, Los Angeles, California, 1970-1979[a]

	Race/ethnicity of victim											
	Anglo			Black			Hispanic			Total		
	Positive			Positive			Positive			Positive		
Day	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total
Monday	51	37.0	138	108	42.7	253	50	57.5	87	209	43.7	478
Tuesday	39	37.9	103	68	37.6	181	37	54.4	68	144	40.9	352
Wednesday	32	27.4	117	100	41.0	244	33	45.2	73	165	38.0	434
Thursday	41	38.3	107	90	43.1	209	28	36.4	77	159	40.4	393
Friday	60	51.7	116	125	54.1	231	64	57.7	111	249	54.4	458
Saturday	44	41.9	105	204	62.6	326	133	62.4	213	381	59.2	644
Sunday	50	42.4	118	180	53.1	339	139	70.6	197	369	56.4	654

[a] Excludes 65 homicides for which racial/ethnic group or day of week was unknown.

[b] Number and percent of victims with positive results.

Figure 3. Blood alcohol detected in male homicide victims aged 15-64 by race/ethnicity and day of week, Los Angeles, California, 1970-1979



1977; le Roux and Smith 1964; Centers for Disease Control 1984; Shupe 1954). For example, Haberman and Baden (1978) reported on the results of toxicologic testing of homicide victims in New York City: Alcohol was detected in 41.9 percent of victims tested over a 12-month period in 1974-1975; in addition, 26.7 percent had blood alcohol concentrations ≥ 100 mg percent. In a recent study of fatal injuries in Fulton County, Georgia, Berkelman et al. (1986) reported that alcohol was detected in 75 percent of black and 80 percent of white male homicide victims in contrast to 59 percent of black and 30 percent of white female victims. Notably,

Figure 4. Blood alcohol detected in male homicide victims aged 15-64 by race/ethnicity and relationship to suspect, Los Angeles, California, 1970-1979

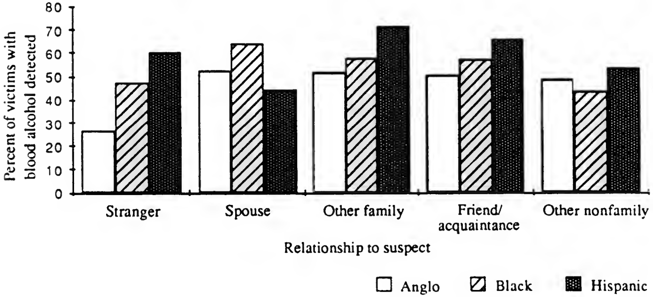


Table 6.—Blood alcohol detected in homicide victims aged 15-64 years by race/ethnicity and relationship to suspect, Los Angeles, California, 1970-1979[a]

	Anglo			Black			Hispanic			Total		
	Positive			Positive			Positive			Positive		
Relationship	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total	N[b]	Percent[b]	Total
Unknown	20	47.6	42	84	50.0	168	97	57.4	169	201	53.0	379
Stranger	56	25.1	223	121	44.8	270	108	57.1	189	285	41.8	682
Spouse	34	41.5	82	127	53.8	236	6	22.2	27	167	48.4	345
Other family	14	46.7	30	41	48.2	85	15	62.5	24	70	50.3	139
Friend/ acquaintance	114	44.9	254	397	52.8	752	184	63.0	292	695	53.5	1,298
Other non-family	26	43.3	60	47	38.8	121	16	55.2	29	89	42.4	210
No suspect	59	43.7	135	67	39.6	169	64	59.3	108	190	46.1	412

[a] Excludes 10 homicides for which racial/ethnic group was unknown.

[b] Number and percent of victims with positive results.

however, no previous study has compared Hispanics, whites, and blacks using biochemical testing for alcohol use. This is particularly important because subjective perceptions of alcohol use may be influenced by racial biases of the investigators who obtain the information and may have predetermined notions about alcohol use in minority populations.

Recent evidence suggests that alcohol consumption and subsequent behavior of people who are drinking can be profoundly influenced by the situation or the environment within which the drinking takes place (Blum 1981; Roman 1981). It may be reasonable to presume, therefore, that by elucidating the situational characteristics associated with alcohol use and homicide victimization among different racial and ethnic groups, new perspectives can be gained that will assist in formulating approaches to homicide research and prevention.

Findings in the present study suggest that alcohol use by Anglo, black, and Hispanic homicide victims was more common on weekends. However, there were two notable racial and ethnic differences. First, the association between day of the week and alcohol presence was most pronounced for Hispanic homicide victims and least pronounced for Anglos. Second, the day of the week on which the highest proportion of victims had detectable blood alcohol was Sunday for Hispanics, Saturday for blacks, and Friday for Anglos.

The evaluation of these weekly patterns illustrates some of the complexities associated with interpretation of variations associated with situational characteristics. The consistency across racial and ethnic groups in the finding of increased presence of alcohol in victims killed on weekends may merely reflect patterns of alcohol use: Patterns of alcohol consumption are cyclical, characterized by a trough on Mondays and a crest on weekends (Harford and Mills 1978; Argeriou 1975). After noting this pattern in Boston, Argeriou proposed that the low frequency of homicides occurring on Tuesday reflects the low quantity of alcohol consumed the preceding day and night. It is reasonable to expect that similarities among the racial and ethnic groups with respect to alcohol consumption patterns and lifestyle (i.e., work and leisure time activities) could account for this consistent pattern. The differences in patterns, on the other hand, may be a reflection of racial and ethnic differences in cultural norms regarding alcohol use and physiologic and behavioral responses to alcohol use or socioeconomic status. Further characterization of alcohol consumption patterns among members of different racial and ethnic groups and analytical epidemiologic studies will be required to elucidate the relative influence of each of these factors in accounting for the weekly patterns. However, a hypothesis for a causal role for alcohol use in homicide victimization is suggested by the fact that alcohol use by homicide victims is greatest in those racial and ethnic groups with the greatest overall risk of victimization (i.e., Hispanics and blacks).

Variations in the proportion of victims with blood alcohol by offender to victim relationship appeared to be greater for those who knew one another previously. However, these patterns were by no means consistent. For example, the proportion of Hispanic victims of spouse homicide found positive for alcohol was quite low relative to both Anglo and black victims of spouse homicide and Hispanic victims in other relationship categories. This situation appeared to be true, however, only for Hispanic female victims of spouse homicide. Nonetheless, these results may reflect patterns of alcohol consumption found in these racial and ethnic groups as they relate to different interpersonal contexts (e.g., familial interactions in the home and peer-group interactions in the street); or, with the exception of Hispanics, they may suggest a hypothesis which posits a greater role for alcohol use in engendering violence between people who know one another. In attempting to explain such patterns, it is again important to separate the influence of socioeconomic and cultural factors on alcohol consumption from their direct impact on racial/ethnic differences in the risk of victimization in different interpersonal contexts.

Methodological constraints in this study and in other descriptive studies must be addressed in future studies of the association between alcohol use and homicide victimization across racial and ethnic groups. First, and perhaps most important, is the need for measurements of blood alcohol levels in referent, or "control," populations or in persons who are not homicide victims. In the absence of such specific measurements, estimates of relative or attributable risk associated with alcohol use by specific racial and ethnic groups are not possible. Second, in this study it was impossible to determine whether homicide victims were chronic or only short-term alcohol users; most other studies employing biochemical measurement of alcohol also have faced this constraint. Information about alcohol use habits is not routinely collected during police investigations and can be only inferred from autopsy findings. This is a particularly important issue when examining racial and ethnic differences in alcohol use by homicide victims, since these habits are likely to be associated with the cultural and socioeconomic backgrounds of homicide victims. Other methodological complexities include variations in the pharmacologic effects of different types of alcoholic beverages, variations in physiologic and behavioral responses to alcohol among different racial and ethnic groups, and the greater likelihood that alcohol use patterns may be similar in victim and perpetrator when they are acquaintances rather than when they are strangers (Schaefer 1982; Tinklenberg 1973).

In conclusion, this descriptive approach alone cannot establish that alcohol is a risk factor for homicide nor that racial/ethnic differences in alcohol use contribute to racial and ethnic differences in the risk of homicide victimization. However, because alcohol consumption patterns are related to racial and ethnic status as well as to other demographic and situational characteristics, and because of the known physiologic and behavioral effects of alcohol, the role of alcohol must be further studied and considered to develop approaches for the prevention of homicide where alcohol is a contributing factor. Future research efforts directed at this problem should employ analytic epidemiologic techniques, including case-control and cohort study designs, that have been used to examine other types of alcohol-associated morbidity and mortality (Haddon et al. 1961; Zylman 1968).

Acknowledgments

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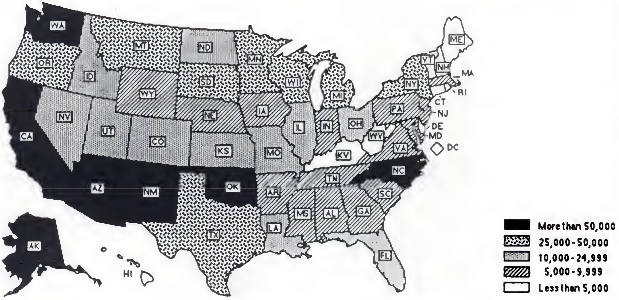
III.

Alcohol Use Among American Indians and Alaska Natives

The American Indian, Eskimo, and Aleut Population: 1980



Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1986* (106th edition) Washington, D.C., 1985.

Selected Social and Economic Characteristics of the American Indian, Eskimo, and Aleut Population: 1980

	Total	Percent
Population	1,534,000	100.0
Under 15 years old	475,000	30.9
15-44 years old	774,000	50.4
45-64 years old	206,000	13.4
65 years old and over	80,000	5.2
Years of school completed		
Persons 25 years old and over	715,000	100.0
Elementary: 0-8 years	179,000	25.0
High school: 1-3 years	140,000	19.5
4 years or more	224,000	31.3
College: 1-3 years	118,000	16.5
4 years or more	55,000	7.7
Labor force status		
Civilians 16 years old and over	1,022,000	100.0
In civilian labor force	584,000	57.2
Employed	508,000	49.6
Unemployed	77,000	7.5
Unemployment rate*	—	13.2
Total families	341,000	100.0
Married couples	245,000	71.8
Female householders†	77,000	22.7
Male householders†	19,000	5.5
Median family income, 1979	$13,724	na‡
Persons below poverty level, 1979	408,000	27.5

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1985* (105th edition) Washington, D.C., 1984.

* Total unemployment as percent of civilian labor force. † With no spouse present. ‡ not applicable

American Indians and Alcohol: Epidemiological and Sociocultural Relevance

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Abstract

A review of the literature on the epidemiology of alcohol use and abuse among American Indians reveals significant variations between the sexes, across various age groups, and among the several subpopulations. Although quantitative data are scarce, it appears that per capita consumption differs markedly, not only within any given tribe but also among various tribal groups. A wide range of alcohol-related problems also occur at strikingly different rates among Native American populations. It is noteworthy that consumption and problems do not appear to covary in a systematic way. Concrete suggestions are provided for improving epidemiological information and for responding to cultural variation in beliefs and behaviors about alcohol use and its outcomes.

Introduction

Less than 400 years ago, American Indians[1] enjoyed a monopoly over the vast and diverse area that is now the 48 contiguous United States. Today, however, American Indians are a small minority, concentrated in a few regions of the country. They constitute less than 1 percent of the population in the last quarter of the 20th century, and, although they are not legally restricted to the reservations, they are not nearly as widespread as larger ethnic minorities. Indians have never had a unified or unitary culture, and some 280 separate tribal entities are recognized[2] by the U.S. Government as "Native Americans."[3]

Studies of American Indians generally deal with tribes and communities. Of the wide range of subjects that have been studied about Indians, alcohol use has been better documented among various American Indian tribes than among native populations in most other parts of the world. Nevertheless, significant gaps still exist in our knowledge of traditional patterns, and the ever-changing cultures of the still-diverse Indian populations leave scientists with almost as many questions as answers. No mention was made of this population (approximately 1.5 million Americans) in a 1979 national survey of alcohol use and related problems (Clark and Midanik 1982). Similarly, papers on recent alcohol-related data sets reflect a recurrent issue: Statistical cells are too small to yield meaningful information with respect to the Indian populations.

There are several detailed guides to the general literature on American Indians and alcohol (Heath and Cooper 1981; Heath 1983*a*; Leland 1976, 1980; Mail and McDonald 1980). In contrast, the epidemiological evidence of alcohol use and abuse is scarce, but helpful in assessing the state of alcohol use and alcohol-related problems among American Indians (Leland 1980; Kunitz et al. 1971; Westermeyer 1976; Westermeyer and Brantner 1972; Mason et al. 1985). This paper is designed to provide a broad overview of alcohol use among American Indians in cultural context, with special emphasis on epidemiological approaches. In keeping with the nature and importance of this subject, some implications for action toward preventing and ameliorating alcohol-related problems are suggested, and appropriate areas for further scientific, informative, and practical research are highlighted.

---

[1] The term "Indians" tends to be used generically in normal English usage, although linguistic, cultural, and other "tribal" differences are often of enormous importance with reference to specific populations. Although some other terms occur in various contexts, the term *Indians* seems most convenient and generally understood. When reference is made to specific populations, "tribal" designations that enjoy broad usage in anthropological, administrative, and other contexts are used.

[2] Official recognition carries with it special rights to limited services, reserved land, self-policing powers, and so forth. Members of many "tribal corporations" lack such recognition.

[3] In recent years, the term "Native Americans" has gained some currency in the United States, especially in political contexts. Different terminology is used in Alaska (i.e., Alaska Natives, Aleuts, or Inuit) and Canada (i.e., Canadian Natives or Inuit); however, these populations are outside the scope of this paper.

Historical Background

North America is historically and ethnographically anomalous in that, prior to the arrival of Europeans, distillation was unknown. Fermented beverages were absent throughout the area, except for a few cultures south of the 35th Northern latitude–areas that a century ago belonged to Mexico. Contrary to popular belief, most American Indians did not eagerly embrace alcohol when it was introduced (Heath 1983*a*), nor did the European newcomers always try to get them to accept it (MacAndrew and Edgerton 1969). The first Federal law prohibiting sales to Indians was enacted under Thomas Jefferson, at least partly in response to petitions from Indian leaders. In spite of the ban, alcohol was often used as a tool of economic exploitation and continuing subjugation throughout subsequent Indian-white relations. Some populations rejected it outright; some were devastated by it. A few experimented with it, and then reacted with revulsion, combining some aspects of Christianity with selected traditional values that included abstention from alcohol as part of a strict moral code. Yet other groups integrated drinking with other important aspects of their cultures and considered it a pleasant and useful adjunct to certain social activities. Indian attitudes toward alcohol today are strongly ambivalent–favoring the related recreational, relaxing, and other positive effects, but resenting a wide range of negative effects that often result from excessive drinking, such as aggression, illness, and accidents. Such ambivalence often is felt by individual Indian drinkers and is a cultural norm articulated in various ways by tribes or groups of individuals. In order to put epidemiological considerations into a meaningful context, it is important to note some of the features and patterns of Indian drinking behavior.

Drinking Patterns

Indians are often thought to have some sort of constitutional or "racial" susceptibility to alcohol that makes them get drunk faster, stay drunk longer, and behave in ways that are dangerous to themselves and to others. This idea, called "the firewater myth" (Leland 1976), is closely linked to the stereotype of the "drunken Indian" (Westermeyer 1974). This stereotype was only briefly laid to rest in the 1950s, when cultural factors came to be widely recognized as important in shaping drunken comportment. Since the 1970s, however, experimental evidence, focusing on enzymatic and metabolic variations among ethnic populations, has raised a new set of questions about the differential physiological impact that ethanol has on "Asiatics" or "Mongoloids"; this subject is discussed in more detail by Johnson (this volume). Some interesting enzymatic features have been identified among Japanese subjects, but the data on American Indians are still so inconsistent that no firm hypothesis has been offered (Schaefer 1981).

A vast, diverse, and widely scattered ethnographic literature exists that describes drinking patterns in a great many Indian communities. Such studies are often rich in anecdotal detail and usually try to show how such patterns relate to a broader sociocultural context. Unfortunately, few of them offer much in the way of quantitative data, even on such basic factors as quantity, frequency, and variabilty of alcohol consumption. It is also difficult to make large-scale systematic comparisons among such studies because they do not regularly follow the parameters that have become standard in scientific surveys of alcohol use.

In recent years, a few outstanding efforts have strengthened our data base with respect to Indian drinking and have addressed some of the shortcomings mentioned above, notably the work of the Western Region Training Center (WRTC) and that of the Indian Alcohol Research Program at the Neuropsychiatric Institute, University of California-Los Angeles (UCLA). The ambitious effort of WRTC has culminated in a compilation of information on attitudes and practices concerning alcohol, together with information on age, sex, occupation, education, residence, and other variables in a large sample from 20 Indian communities over a 2-year period (Moss 1979). Eighty-one tribes were represented among the 266 "leaders" and 2,852 "heads-of-households" who responded at considerable length to a survey in nine western States. The Indian Alcohol Research Program at UCLA has also focused on the western half of the country, over a longer period, with a broad but less rigorously random sample from Siouan-speaking populations (Omaha and Winnebago), Navaho, the "Five Civilized Tribes" of Oklahoma (Cherokee, Choctaw, Chickasaw, Seminole, and Creek), and a number of indigenous California tribes, both in their native rural areas and in the urban settings of Los Angeles and Riverside Counties in California. Each of these programs has produced a wealth of important and useful data (Moss 1979, 1981; Moss and Jansen 1980; Weibel 1981, 1982; Weibel-Orlando et al. 1984; Weisner et al. 1984) of which a few key points are noted here.

Many laypersons might presume that any Indian population group would include an inordinately high rate of heavy drinkers. On the other hand, people who have at least a superficial familiarity with the recent literature on alcohol use might accept the premise that such heavy alcohol consumption is limited to a small portion of the Indian population whose members drink markedly more than most others in that population. The Indian data fit neither of these patterns. Instead, the American Indian population comprises many abstainers and many heavy drinkers, but relatively few moderate drinkers. The general data from large surveys confirm the findings arrived at by aggregating data from various local studies (Lemert 1982; May 1982; Leland 1980).

At the same time, the surveys also substantiate a point that has been almost universally reiterated by those who study American Indians—that variation among local populations is so great that any broad generalization is suspect. For example, the stereotype of spectacular binge drinking among Indians is well established, not only in folklore but also in a number of apparently authoritative sources. However, it is more than an ethnographic curiosity that there is virtually no drinking among many other Indian populations. A similar example is the fact that most studies of Indian drinking have focused on drinking among men, who have been found to drink more, and more often, than Indian women. These generalizations are true about men and women throughout the world as well as among American Indians. But the UCLA survey has recently uncovered what may be the famous "exception that proves the rule": urban Sioux women drink almost as frequently as the California men and drink *more* frequently than the Five Tribes men, and the rural Sioux women drink more frequently than do the rural Sioux men (Weibel-Orlando 1986). The tentative nature of these findings (based on a sample of "only 20") is stressed, but the uniqueness of any instance in which women appear to drink more than men commands our attention and calls for further research. Such a finding not only should prompt more research on women's drinking and its outcomes in this and other populations, but also should challenge what has been treated as one of the few cultural universals with respect to alcohol use.

Apart from the theoretical importance of such a finding, there may be significant epidemiological implications as well. In fact, one basic justification for social and behavioral studies of drinking patterns is the role that those patterns play in determining the kinds of alcohol-related problems that occur within a population and the rates of occurrence of such problems. A vivid illustration of this is a comparative epidemiology of the Hopi and Navaho tribes, who occupy essentially the same geographic and ecological setting and have been subject to the same laws and other controls for more than a century. In fact, the Hopi Reservation is an enclave totally surrounded by the Navaho Reservation. In keeping with their generally temperate philosophy, most Hopis do not drink, whereas many Navahos drink heavily. As might be expected, the Navaho have an unusually high rate of violent deaths, including accidents. Quite unexpectedly, however, the age-adjusted rate for cirrhosis deaths among the Navaho is slightly less than that for the general U.S. population, whereas that for the Hopi is over four times higher (Kunitz et al. 1971). This apparent anomaly becomes comprehensible when one recognizes that Navaho binges, however spectacular they may be, occur only episodically so that even a heavy drinker's liver has ample time to recuperate. By contrast, those few Hopis who drink at all tend to be ostracized from the traditional communities and cluster together in an unusual rural variant of the Skid Row pattern.

With such stark cultural differences between neighboring populations, it seems specious to reiterate in this context the generalizations about American Indian patterns that have been perpetuated in much of the writing, even by well-intentioned scientists and health professionals who are sympathetic to minority populations and who want to foster popular and fiscal support for more and better services directed to those populations.

Epidemiology of Alcohol-Related Problems

> One long-term observer and clinician asserted unequivocally that Alcohol abuse is the most widespread, severe and all-encompassing health and social problem among American Indians today and has been for many years.... Nothing is more costly to the Indian people than the consequences of alcohol abuse whether measured in physical, mental, social or economic terms for the individual, the family unit, the community or indeed, the entire Indian Nation. And the problem is growing worse among a people who can least afford such inroads upon their health and well-being.
>
> (Andre 1979, p. 1)

In view of the multiplicity of economic, social, and other problems that confront American Indians, it seems almost melodramatic to point to "alcohol abuse" as cardinal among them. However, Andre cites epidemiological evidence to support his assertion. Several of the most frequent causes of death among Indians are said to be "alcohol related" to a significant degree (accidents, chronic liver disease and cirrhosis, suicide, and homicide), and much of the morbidity suffered by Indians may also be partially caused or aggravated by drinking. Brief consideration of each of these categories follows.

Mortality

During 1978-1980, the 10 leading causes of death for American Indians in order of frequency were diseases of the heart, accidents (which, incidently, ranked first among males), malignant neoplasms, chronic liver disease and cirrhosis, cerebrovascular diseases, pneumonia and influenza, homicide, diabetes mellitus, certain conditions originating in the perinatal period, and suicide (U.S. Indian Health Service [IHS] 1984*a*[4]). "Alcohol abuse" has frequently been cited as a direct contributing factor in 4 of the top 10 causes of Indian deaths: accidents, chronic liver disease and cirrhosis, homicide, and suicide. An important consideration in terms of the overall public health context is recognition that the life expectancy of American Indians, while still lower than it could be, has increased markedly in recent years. Major strides have been made in the control of sanitation and acute infectious diseases, so that life expectancy at birth has increased from 51 years in 1939 to 71 years in 1981 (IHS 1984*b*).

Accidents. Accidents have been the major cause of death among Indian males for several years and were only recently supplanted for first place among Indians overall. During 1978, accidents accounted for 19.5 percent of all Indian deaths (three times the accidental death rate among the general U.S. population in 1979) and fully 23.4 percent of male Indian deaths. It should be noted that data on the involvement of alcohol in fatal accidents[5] are notoriously scarce in terms of systematic empirical evidence, but, as is often the case among other populations, the educated guesses of long-term observers are frequently cited.

One local study (among the Papago) indicated a close association between accidents and "modernization" (Hackenberg and Gallagher 1972), but no significant difference was found by another researcher studying the same population (Stull 1973). A tragic irony is that reservations that have remained "dry" under local option have more accidental fatalities than those that have allowed the sale of alcoholic beverages (May 1976). Again, firm data are lacking, but it is presumed that many such deaths occur when crowded cars or trucks with drunk and often inexperienced drivers crash on long trips that were prompted by a quest for alcohol.

Many types of accidents other than those involving motor vehicles are also included within this broad category. In the absence of data to the contrary, a majority of these accidents are widely thought to be alcohol related.

Chronic liver disease and cirrhosis. This broad category is the fourth ranking cause of death among American Indians, accounting for 6 percent of deaths. In comparison, it is the eighth leading cause of death in the overall U.S. population, accounting for about 1.6 percent of deaths.

Ever since the cirrhosis death rate became widely used internationally as an index of alcoholism, most people who work in the field of alcohol have tended to emphasize long-term excessive drinking as the major cause of cirrhosis and to think of other hepatic pathologies as reflecting progressive alcoholic degeneration of that vital organ. The liver is susceptible to a variety of diseases, some of them congenital, and to damage from nutritional imbalance, parasites, hormonal factors, overexposure to radiation or a number of pollutants, and other factors. Not only would much chronic liver disease have such nonalcoholic etiology, but any or all of those problems would also increase the risk of cirrhosis in an unpredictable manner (Lelbach 1975). Hepatitis is common among American Indians, as are malnutrition and undernutrition. Many tribes have a high rate of fat in the diet or are in close and sustained contact with sheep (which often carry insects that are vectors for hepatic infection). Another factor that may be of special relevance concerning the high rate of cirrhosis among Indians is exposure to radioactive or toxic chemical waste that has been dumped in many areas that Indians occupy.

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[4] Data from the IHS also include "Alaska Natives." Since Indians from the lower 48 States make up an overwhelming majority of the statistical population, there is presumably little to be gained from disaggregating the findings on mortality causes and rates reported by IHS.

[5] The determination that an accident or other sudden death is alcohol related is not standardized. Presumably, most data of this type are based on reports from police, medical examiners, emergency room staffs, and others who utilize elevated blood-alcohol levels found in victims, assailants, drivers of implicated vehicles, or others whose actions are presumed to have influenced the outcome.

In examining regional variations within the State of Oklahoma, Stratton and colleagues (1978) found higher cirrhosis rates among Indian populations whose ancestors had been hunters and gatherers than among others who came from more pacific, sedentary, agricultural backgrounds. Any conclusion resulting from this finding is based on some not-so-tidy data, inasmuch as variation among the former groups (Cheyenne, Arapaho, Kiowa, Comanche, and Apache) was greater than the difference between them and the Cherokee agriculturalists. An anthropologist, reworking the same epidemiological data, suggests that a complex interaction of child-training patterns and a variety of acculturative factors may better account for different drinking patterns and associated different rates of cirrhosis (Stahl 1979). It is noted that sociocultural factors, especially drinking patterns, account for a high cirrhosis death rate among the Hopi, but it is still not clear why the neighboring Navaho have a rate that is even lower than the national age-adjusted rate (Kunitz et al. 1971).

The statistics for cirrhosis are especially striking with reference to women–so dramatic that it is difficult to interpret them. Although women drink less than men in most populations, "Indian women appear to be dying of cirrhosis at more than triple the rate of black women and at six times the rate of White women" (Johnson 1978, p. 3). In fact, "females account for almost half of the total cirrhosis deaths among Indians" (Johnson 1979, p. 2). The contribution that hormonal balance makes to accelerating the damage associated with cirrhosis is not well understood, but it is clearly an epidemiological anomaly that deserves further study.

By drawing attention to nonalcoholic factors in the etiology of cirrhosis, it should not be assumed that long-term heavy drinking is discounted as another causal factor. The important point is that too much of the data and too many interpretations have totally ignored nonalcoholic factors, to the extent that researchers may be overlooking some potentially important preventive measures–many of which may have little or nothing to do with drinking–that could be taken toward increasing Indian health.

Homicide. Homicide ranks seventh among the leading causes of Indian deaths. It accounts for 3.3 percent of Indian deaths–a rate that is more than double that for the overall U.S. population (for whom it is not among the top 10 causes), but considerably lower than that for other nonwhite minorities. The popular conception that alcohol automatically triggers aggression has been generally discredited (Heath 1983b; Room and Collins 1983). Anecdotal evidence predominates in most discussions of alcohol and homicide. Unsystematic retrospective surveys of prisoners are often used to show the alcohol-homicide linkage, but such studies may be colored by the supposed exculpating quality of drunkenness, or they may reflect deliberate use of alcohol either to give one "courage" or in the hope that one could enjoy blameless "time-out." One ambitious systematic effort to trace the history of homicide focused on this country's largest tribe for over a full century, during which the rate was remarkably constant. Interestingly, the homicide rate remained fairly constant not only through time (while alcohol consumption increased markedly) but also in different communities, despite marked differences in degree of acculturation, proximity to legal liquor sales agencies, and other factors (Levy et al. 1969).

Suicide. The rate of suicide among Indians–2.6 percent of deaths, or about 22 per 100,000–is almost double the rate for the overall population of the United States. The age-adjusted suicide death rate has consistently been higher for Indians than for the general population and also higher than for other nonwhite minorities. However, rates vary greatly among tribes, ranging from 8:100,000 to over 120:100,000. Such numbers are often statistically meaningless when based on small populations, which is the reason for Westermeyer's (1976) suggestion to use "person-years of exposure to risk" as a more meaningful index. In a systematic study of 100 known attempts and successful suicides among the Zuni, resident IHS personnel judged that alcohol had been involved in 83 percent of the attempts, and 78 percent of the suicide victims had a history of excessive drinking (Andre and Ghachu 1975). Among the nearby Navaho, suicide, like homicide, changed little during a century of drastically increased alcohol consumption, acculturation, and presumably other stresses (Levy and Kunitz 1974). At a time when adolescent suicide appears to be rising rapidly in the general population, it is dropping slightly among Indians, although teenagers still account for the majority of the cases.

Other causes of death. It was only during the late 1970s that "diseases of the heart" became the principal cause of death among Indians, as has been the case for some time among the general U.S. population. This category accounts for 20.8 percent of Indian deaths, just over half the rate among others. "Malignant neoplasms," the third highest cause of death for Indians (10.1 percent), rank second (at twice that rate) for the general population. "Cerebrovascular diseases" rank fifth among Indians and third in the general population, accounting for 4.8 percent of Indian deaths as compared with 8.9 percent overall. "Pneumonia and influenza" are sixth for both Indians and others, causing 3.8 percent of Indian deaths and 2.4 percent of others. The eighth leading cause of death for Indians is diabetes mellitus (seventh in the general population), accounting for 2.9 percent of Indian deaths and 1.7 percent of others.

Some plausible associations could be postulated between alcohol consumption and each of the 10 major causes of Indian deaths, but systematic epidemiological data are lacking. A few points deserve mention on the basis of the existing literature. With respect to "malignant neoplasms," the striking synergistic effect of smoking and drinking that has been noted among American whites may not be true among Indians, because there appears to be an inverse relationship between frequency of drinking and cigarette smoking among several Southwestern Indian tribes. The category of "certain conditions originating in the perinatal period" may include conditions that have popularly been perceived as evidences of "fetal alcohol syndrome" (FAS), but are now more appropriately referred to as "fetal alcohol effects" (FAE), such as failure to thrive, mental retardation, and a variety of other disabilities. In many cases, these conditions are generally thought to result from direct toxic injury to the fetus during a mother's drinking. Some Indian communities suffer dramatically from FAS and FAE, but they do not constitute a characteristically ethnic phenomenon, with rates ranging between 4.59 and 30.49 per 1000 women of child-bearing age among various Indian populations. Those figures can be misleading, however, in view of the fact that fully one-fourth of these women produce more than one FAS- or FAE-injured baby. (It should be noted that although FAS and FAE are generally spoken of as outcomes of a woman's drinking, there is increasing evidence that long-term heavy drinking by men may cause teratogenic damage to the germ plasm such that some fathers rather than all mothers may be responsible. Our concern should not be to assign blame but to help prevent this kind of harm.) Quite apart from the damage done to the children and their immediate families, the presence of so many severely handicapped chidren places significant burdens on communities and on various kinds of helping services, especially where resources are scarce.

Morbidity

In assessing the interrelationships of culture, epidemiology, and prevention, it is important to consider figures on mortality and morbidity. In that connection, an IHS survey of patient discharges from general hospitals in 1979 reported 8,018 per 100,000 with alcohol-related illness or injuries–more than three times the rate for patients in the general population, and double that for the overall nonwhite patient population (Andre 1979). Andre recounted the 10 major causes of Indian deaths, which differ slightly from the more recent data reported here, and went on to list causes of morbidity that are *directly* related to alcohol abuse but do not immediately (but often eventually) result in death, such as accidental injuries, cirrhosis of the liver, alcoholism, attempted suicides, attempted homicides, malnutrition, pancreatitis, gastrointestinal bleeding, fetal alcohol deformities, mental and emotional disorders, organic brain syndromes, alcoholic heart disease, primary cancer of liver and pancreas, and child and wife abuse or neglect. He also cited some causes of morbidity that are indirectly related to alcohol abuse but nevertheless aggravated by it, such as infections, diabetes, convulsive disorders, hypertension and heart disease, respiratory disorders, neuritis, and anemias (Andre 1979).

The links between drinking and a variety of morbid states sometimes can be ascertained with a high degree of probability for individual cases, but epidemiological approaches have not been sharply focused in ways that facilitate firm judgments with respect to populations. Insofar as the predominant pattern of Indian drinking may fit the stereotype–episodic binges alternating with long periods of abstinence–it should be recognized that the progressive organic deterioration so familiar in certain types of white alcoholics is highly unlikely. There are other economic, nutritional, and social factors that must be weighed in an assessment of Indian health.

Alcohol researchers should have no illusions that the primary "cause of death" on a certificate is clearcut and indisputable, nor that the state of health of a hospitalized patient is adequately characterized by the "primary diagnosis" that goes into the institution's statistics. Another methodological issue concerns the fact that in facilities operated by the IHS, admission is limited to those individuals who have demonstrated the required "percentage" of Indian descent. In most surveys, simple self-identification is the basis of assignment to ethnic categories (as in the census), or in various treatment centers, the assignment of supposed ethnicity may be done by whoever completes the intake form. In addition, IHS data are reported sometimes by State and sometimes by region. Such reporting mechanisms limit any assessment of services that might be appropriate locally in terms of public health or social welfare.

Mortality data are undoubtedly affected by the fact that autopsies are not performed in IHS clinics (Hedin 1983). One can only wonder how much a change in this respect might affect statistics on causes of death among Indians. Morbidity data are undoubtedly affected by a wide range of factors, from the scale of local facilities to the interests of practitioners, quite apart from local variations in disease vectors, living conditions, and so forth. As far as mental health is concerned, only limited usable data exist, except with reference to Alaska Natives. More could be done in compiling and sharing data, in ways that would not merely benefit researchers but would also be helpful to IHS and to the American Indian and Alaska Native communities.

Other Social Problems

The vast literature on alcohol and Indians deals with a wide range of issues that can be important for non-Indian as well as Indian populations. If "epidemiology" is viewed in the broad sense of the word, researchers should be addressing not only mortality and individual morbidity, but also some forms of social and cultural morbidity. With specific reference to Indian alcohol use and its outcomes, some of the themes that recur are crime, spouse and child abuse/neglect, and fights. In fact, one investigator, who combines anthropological insights and long-term clinical experience with Indians, makes the point that a variety of social indicators have positive epidemiological value. Some objective events that often serve as signals for early identification of Indian alcoholics or alcohol abusers might fruitfully be adapted as a basis for estimating the prevalence of alcohol abuse in other populations: postneonatal infant mortality, child abuse, foster child placement, alcohol-related arrest, imprisonment, and mortality from accidents or pneumonia (Westermeyer 1976).

A topic on which much has been written, but for which substantive data are still scarce, is the close association of alcohol and crime among American Indians. As early as 1960, Stewart (1964) was concerned that 76 percent of all Indian arrests in the entire country were for crimes that were explicitly alcohol related. What has become of that statistic after two decades of increasing public acceptance of individual expression, widespread decriminalization of public drunkenness, and a variety of other changes that might once have been called "liberal" or "progressive"? In the 24 Indian communities that are under the Albuquerque (New Mexico) area jurisdiction of the Bureau of Indian Affairs Law Enforcement Services, alcohol-related offenses (notably "drunkenness" and "disorderly conduct") accounted for as much as 94.7 percent of the total crimes in 1981, and in only one community did they account for less than 50 percent; nationally, some 70.2 percent of crimes committed on Indian reservations were alcohol related (Hedin 1983). It is commonplace for police in some towns that border on reservations to jail Indians for drunkenness and then to levy a fine of "whatever jewelry the Indian was wearing" (Kelly and Cramer 1966). Even the big, impersonal city offers no place to hide: A review of the Los Angeles Police Department blotter showed that 89.9 percent of all adult Indian arrests were for intoxication (Bramstedt 1977). It may well be that the link between alcohol and crime is more a problem *for* Indians than it is a problem *of* Indians; the important point is that these are generally victimless crimes.

In many Indian communities, drunkenness tends to be treated as "time-out" (MacAndrew and Edgerton 1969); it has already been acknowledged that many observers link homicide with alcohol, although the data are inconclusive. Similarly, frequent allusions are made by those who have close and sustained contact with Indians to drunken fighting as a socially disruptive event, even if not a criminal offense. A clear demonstration that the supposed disinhibiting quality of alcohol is not simply a pharmacological impact on the brain is Heath's (1952) detailed analysis of fights in a Navaho community; kin ties and other sociocultural factors allow predictions of who attacks whom, often in striking contradiction to what might be expected on the basis of proximity, frequency of contact, or other less value-laden facts.

Clinical and ethnographic evidence suggest that some heavy drinkers abuse or neglect their spouses and that some also abuse or neglect their children. When the cost of drinking interferes with other aspects of a household budget, other social problems may occur. Unwanted pregnancies are often rightly or wrongly found to have occurred in a context of alcoholic intoxication. As in most societies, alcohol can be implicated in a wide range of social problems, although researchers should hesitate to point the finger until more substantive data are available. In fact, among the Navaho, the heaviest drinkers have the most stable families and are relatively wealthy (Levy and Kunitz 1971).

Special Indian Populations

This discussion emphasizes a point that is too often ignored with respect to so-called minorities, namely the significant diversity that occurs within any such population. When dealing with 280 or more tribes, many of which had very different histories and have very different economic, religious, cosmological, political, linguistic, mythological, social, and other systems, it is patent that simple stereotypes are likely to miss the mark widely. Several guidelines have been published to help anyone who is seriously interested in addressing the many kinds of variation that are important to our understanding of alcohol use and its outcomes among American Indians (Heath 1983*a*; Heath and Cooper 1981). In the present context, it seems appropriate to signal only briefly some of the more gross categories that may be useful in comparing the Indian epidemiological situation with that of other minority populations in the United States: Women are one such category, youth another. Reflecting the extant literature more than any logical classification, a third category of "others" introduces the occasional importance of rural-urban differences and degree of acculturation (or its obverse, traditionalism).

Women. Among American Indians, even to a greater extent than among most other populations, research on drinking has traditionally focused on men. Little attention has been paid to women's attitudes or behavior concerning alcohol. The dominant pattern, as in most of the world's populations, is that men drink much more often than women and that men also drink larger quantities. Only a few researchers have recently begun to question whether normal differences in weight and fluid-mass ratio in the body may result in narrowing or even obliterating such sex differences in terms of person hours at a given blood-alcohol level. No such studies appear yet to have been conducted with Indians, although some populations seem especially appropriate.

Women constitute only about 20 percent of the clients in Indian alcoholism treatment programs. As is the case with most other populations in this country, it is often thought that a greater need remains unmet because of women's reluctance to enter treatment, lack of appropriate facilities, and so forth. One indication of need is that fully 25 percent of the Indian women in the State of Washington have gone through such programs (Patricia Silk Walker, personal communication). The anomalous ethnographic case of Sioux women who drink more than men in that tribe and in some other tribes (Weibel-Orlando 1986) and the concern with FAS and FAE that has focused attention on drinking among women who may be pregnant are reemphasized here. Among Indians, a need clearly exists for more serious inquiry into drinking patterns among women, the outcomes of women's drinking, and channels through which more women might seek help.

Youth. During the past decade, increasing attention has been paid to drinking by young people in several populations, and American Indian studies have followed that trend. The relatively young average age of Indians lends special importance to this category. Although anthropologists wonder about the validity of self-reported survey responses of adolescents and are concerned that reliance on in-school populations is not fully representative of young Indians, the work of Oetting and his colleagues (1979, 1985, in press) reveals many interesting details and suggests some potentially important patterns. Their findings fit with those of others, providing consistent evidence that young Indians have a higher rate of problems with alcohol than their white contemporaries: 42 percent of males and 31 percent of females, as compared with 34 percent of white males and 25 percent of white females (May 1982). Gross national figures can be misleading, however; several local surveys of Indian adolescents found from 17 percent to 46 percent to be "heavy drinkers" (May 1982). Although alcohol is consistently the drug of choice among those Indians who elect to alter consciousness by pharmacological means, it is often combined with marijuana, solvents, or other drugs. All such studies that rely heavily on paper-and-pencil self-report surveys gathered from in-school populations (excluding a large and important segment of the young Indian population that attends school only briefly) must be viewed as less than perfect representations of reality.

Despite these limitations, such studies tend to be quite consistent in underscoring a few points that may be relevant. "Indian youth seem to start experimenting with alcohol earlier, and use it more often than their non-Indian counterparts" (Mason et al. 1985, p. 30). Alcohol is the drug most widely used by high school students, with more than one-half of 7th graders having at least experimented with it, rising to 90 percent of 12th graders. But one's having "ever tried alcohol" can be grossly misleading if given too much weight, since many young people who try alcohol once may never drink again. More pertinent to our concerns is that only 6 percent use alcohol on a weekly or more frequent basis–again, not much higher than in other sectors of the overall population. A lower percentage of high school students on reservations had experimented with alcohol than is the case among the non-Indian urban population, but more Indian students reported having been "high" (42.2 percent versus 26.6 percent) or "drunk" (34.8 percent versus 21.3 percent) during the 2 months prior to the survey (Oetting and Goldstein 1979).

It should not be assumed that adolescent drinking patterns necessarily presage a lifelong pattern. Among the general U.S. population, most males never again drink as much as they did when 16-20 years of age, and most Indian men who have been long-term heavy drinkers decrease consumption markedly beyond age 40 years (IHS 1977). Nevertheless, it is young Indians who most often die of homicide or suicide, and an inordinate percentage are victims of various kinds of accidents. Furthermore, any realistic plan for preventing or ameliorating a wide range of alcohol-related problems should undoubtedly focus on changing attitudes and values as well as behavior patterns of the youth.

Other categories. There is still some validity to the popular image of American Indians being closely tied to the land with which they enjoy a special ecological and religious relationship. At the same time, it should be kept in mind that more than half of American Indians now live in cities, so some comparisons can be made along the rural-urban dimension that sociologists and epidemiologists have occasionally found helpful in discussions of alcohol use among other populations.

Data are both scarce and inconsistent in this connection. Among the Lumbees of the Southeast, 19.3 percent of the rural sample were "heavy drinkers," as were 32.6 percent of those who had migrated to Baltimore (Beltrame and McQueen 1979). By contrast, among Navahos in the Southwest, it was found that "the highest intensity of involvement with drinking and the greatest use of alcohol was found among the most traditional and least acculturated group, while the lowest use and involvement was found in the most acculturated off-reservation group" (Levy and Kunitz 1971, p. 109). For several years, Weibel-Orlando and her colleagues have systematically compared urban Indians and others in the communities from which they migrated. Compared with their rural counterparts, twice as many of the urban Indians from California tribes were found to drink twice a day, but average consumption among urban Indians from several tribes was found to be less than among their rural relatives (Weibel 1982). On the basis of a survey of 20 Indian communities, it was found that

> . . . in *general* the rate of Indian drinking is greater in urban areas than in reservation areas. Interestingly, the 69 percent "admitted user" rate among urban Indians is no greater than the drinking rate among Americans in general. So all this talk about the high rate of drinking among Indians is *not that a greater percentage of Indians drink* (as shown by these figures) but *it must be related to the way they drink. . . .*
>
> (Moss 1981, p. 5)

Obviously, a major portion of the alcohol-related problems among Indians, as among most other ethnic categories, results from long-term heavy drinking by a relatively small segment of the population.

It would be misleading to presume simplistically that migration to the city is necessarily associated with rejection of traditional Indian beliefs and customs so that individuals are caught between two worlds and resort to drinking in confusion or reaction to stress. Ample evidence suggests that a significant portion of the urban Indian population clings diligently to the ways of their ancestors and that others do so in a selective manner, combining participation in their native communities with participation in modern urban industrial society. It probably also deserves to be mentioned that this often occurs with no apparent social or psychic stress on the individual. Such findings should not be surprising in light of what we know about role playing and ethnicity in many other contexts, but some of the literature in the health and social sciences tends uncritically to perpetuate the stereotype of urbanism as damaging to migrants.

Another topic that deserves special mention in this context is acculturation. Not only is the process important in terms of what has been happening to American Indians during the past centuries, but it is also relevant to our understanding of changes that have occurred in the drinking patterns and style of many other groups within the United States. Unfortunately, there is considerable misunderstanding about acculturation, so this seems a good place to mention some important points. Among many people who deal with minority populations in terms of a variety of interests, acculturation is too often spoken of as a simple process of diffusion, almost like osmosis. The imagery is that newcomers (or natives subjected to an alien group) gradually absorb the beliefs and patterns of behavior that characterize the dominant population and that they do this in an unselective, almost automatic, and progressive manner. The reality is far more complex, with interpretations, differential perceptions, reconstructions, and a host of other active factors influencing the selective adoption, rejection, or adaptation among elements of the "new" cultural inventory, just as selectivity also shapes what is to be dropped (or kept) from among earlier patterns. Acculturation is by no means automatic or inevitable, and much that has been said about its role in changing alcohol use is simplistic labeling that treats acculturation as a deus ex machina rather than a complex process involving social interaction and elaborate decisionmaking.

With specific reference to American Indians, degree of acculturation (or its obverse, traditionalism) is measured in various ways, but generally emphasizes language, apparent adherence to traditional values, participation in non-Western activities, and so forth. Because the criteria of acculturation are so diverse and the data so inconsistent, it appears pointless at this stage of research to venture any broad generalization, except to warn against the popular presumption that acculturation invariably results in stress, which in turn prompts heavy drinking. As a cautionary tale, one is reminded that, among the Navaho, the heaviest drinkers were shown to be the *least* acculturated and the most wealthy to have the most stable families (Levy and Kunitz 1974). The fact that rural-to-urban migrants do not normally cut their ties with friends and relatives or abandon a wide variety of traditional activities has already been mentioned.

Positive Aspects of Indian Drinking

At the risk of being challenged for "problem deflation" (Room et al. 1984), it seems logically compelling to include at least some brief discussion of positive aspects of alcohol use. This review would be remiss if the positive aspects of drinking were ignored; that is, "drinking is very pleasurable for North American Indians.... It imparts a spirit of social recklessness, confidence and courage . . . [and] even partakes of the aura of a religious experience" (Thomas 1981, pp. 32-33).

As with other populations in this country and throughout the world, there has been little systematic effort to assess the benefits that Indians may accrue from alcohol use. This situation occurs in spite of the fact that many studies of local populations include considerable discussion of the recreational, socializing, celebratory, relaxing, and other positive features that Indians cite in connection with drinking (Heath 1975, 1986, in press). Indian bars have been aptly described as key social institutions in some large cities, serving as important bases for social networking that is helpful to individuals in seeking employment, housing, health and welfare services, and other valuable information (Fiske 1979), as well as banking services, companionship, relaxation, and perhaps even some symbolic reaffirmation of Indian identity (Lurie 1971). Some tribes have used alcohol in a religious context, as a facilitator for the attainment of supernatural experiences, dreams, and the quest of a vision that is crucial to a young man's spiritual and social maturation. The socially integrative function of drinking is often cited, by researchers and Indians alike, as of cardinal importance for an understanding of alcohol in sociocultural context. For some tribes that traditionally exalt novel physical sensations, alcohol takes on special value. Among urban Papagos, long-term exchanges of drinks aptly reflect a complex system of social credit and personal power (Waddell 1975). Among the Winnebago, Hill (1974) has described the hard-drinking young "hell-raiser" as a normal phase in the developmental cycle toward the stable adult status of sober "family man." Room (1984), however, found fault with ethnographers for focusing on the positive aspects of alcohol use. Epidemiologists need to be concerned not only with identifying such forces and how people encounter them, but also, in many instances, with why people go out of their way with the clear and deliberate purpose of encountering them. To view alcoholic beverages in any other light would be not only naive but misleading.

Implications for Action

It could be construed as irresponsible to highlight some of the positive reinforcements that Indians enjoy from drinking and not to add some recommendations for learning more about the epidemiology of alcohol use and its outcomes. The author has for several years invested considerable effort in trying to impress others with the importance of sociocultural variations as they relate to beliefs and behaviors about alcohol and its effects. In recent years, this viewpoint has gained widespread acceptance. The recognition of the importance of conceptual, evaluative, and behavioral differences among minority populations, and of the degree to which they affect the nature and rates of occurrence of various problems, is gaining momentum among alcohol researchers. Obviously, such understanding is not merely an interesting academic exercise; it brings with it implications for action that have immediate practical relevance, especially in a field where health and social welfare are so intimately linked with the phenomena under study.

One theme that has been implicit throughout this review, and should again be made explicit, is that of variation *within* the Indian population. As with other minorities, too many symbolic gestures have been made at the level of categorical stereotypes. Epidemiological data on "generic Indians" can be as misleading as comparable data on "generic Hispanics," "generic blacks," or, for that matter, "generic whites" or "generic Americans." The differences among Indian tribes reach into fundamental levels of consciousness and values. It is probably generally recognized among anyone who cares about alcohol and related problems that each *individual* differs in some important respects from others, but it is sometimes overlooked that each *community* also differs significantly from others. This recognition must be kept in mind, and must help to shape programs and policies if we are to get beyond the label of "American Indians" to deal with human beings.

It would be helpful at the outset if we knew more about Indian drinking and its concomitants. Efforts along the lines of the Western Area Training Program and the UCLA Indian Alcohol Project should be encouraged. Although only skilled personnel can carry out some of the delicate and difficult tasks of social research, there may well be some parts—survey instruments, inventories of facilities, etc—of large research ventures that could be adopted or adapted by interested individuals who could collect at least some relevant data from communities that are now unknown or only slightly represented in the literature. The idea is not that every service person in an Indian community should become an amateur social scientist but that people familiar with local situations respond to relatively simple, standardized questions in ways that could go far toward filling the enormous gaps that remain in terms of basic data.

Interested people need not even take special initiatives with survey instruments or unfamiliar forms. One of the special values of the social-indicator approach to the epidemiology of alcohol-related problems as proposed by Westermeyer (1976) is that the data are already available in widespread public agencies. Such sources could provide a sort of "triangulation" that would be helpful in identifying the nature and extent of relevant problems and needs.

A more direct approach that has received considerable support around the world as well as among American Indians may be less effective than its proponents predict. There has been widespread clamor in recent years for increasing controls on availability of alcoholic beverages, based on the proposition that such action would offer a quick, simple, and inexpensive way of preventing the full range of alcohol-related problems. Unfortunately, the history of such controls is no more encouraging in that respect with relation to American Indians than it is for most other populations throughout the world. Among the Navaho, there was virtually no difference in drinking patterns during prohibition and after repeal (Heath 1964). Contrary to the expectations of many, research has demonstrated that alcohol-related death rates (including alcohol-implicated cirrhosis, suicide, and vehicular accidents) were lower on Indian reservations where drinking was legal, in comparison with other reservations that had exercised local options to remain "dry" (May 1976). Clearly, "prohibition may have had some beneficial effects, but in general has not been very effective in containing the problem of alcohol abuse and alcoholism in Indian communities. In fact, there are those who claim it has made this problem worse" (Moss 1979, p. 1).

An interpretation of the same rich corpus of data elsewhere suggests "that this excessive drinking pattern arises primarily out of unhealthy attitudes associated with drinking such as (1) a general attitude that alcohol abuse is *the acceptable way* of drinking, (2) that drinking is *the primary* recreational activity in many Indian communities and (3) that problems arising from drunkenness are *excused* or taken for granted 'because the person was drunk'" (Moss 1979, p. 1). Most Indians and most others who have worked with Indians recognize these attitudes as influential in those instances where excessive drinking often results in important problems. One clear implication of this is that education about drinking and drunkenness, if appropriately presented, could have a significant impact on such problems. Such educational efforts should not be restricted to the classroom but should reach out into the entire community. Clearly, these efforts would have no prospect of any impact unless tailored to the language, meanings, understanding, values, and general cultural ambience of the particular community.

Therapy and other approaches to treatment have not been discussed, although they can sometimes have an important feedback effect on community problems by cutting short an individual's career of alcohol abuse. Pros and cons of several different approaches to alcoholism treatment for American Indians have recently been reviewed by several investigators (Weibel-Orlando 1985; Mail and Menter 1985), and IHS appears to be conducting a major evaluation of such efforts.

The very fact that IHS is currently engaged in a major review of needs, facilities, and goals with respect to alcoholism and related problems suggests that it may be timely for a special effort to be invested in intramural research; it could be done without great expense or effort, relying on existing data or on data generated in the course of regular IHS functions. An obvious starting point would be to explore the interrelationships among several of the factors that have been called alcohol related to some significant degree, such as the various causes of death, nonfatal accidents, many diseases, and trauma, on the one hand, and various indications of the degree and manner in which alcohol may have been implicated, on the other. One simple and effective measure would be to take a blood sample from every patient who is admitted. Proper storage is simple and inexpensive so that, in the event of death, a specimen would be available for analysis that reflects the condition at the time of intake. (This could be important, for example, as a retrospective measure of blood-alcohol level, even after the patient's metabolic processes had detoxified the patient; this practice is legally required in Rhode Island.)

Another measure that could yield valuable information would be a systematic review of IHS patients' medical records. (Presumably some sampling would be necessary, in view of the size of the data pool, but one could also make an argument for the most complete analysis that is feasible.) In such a review, attention should be paid not only to primary diagnosis but also to all other diagnoses and major symptoms—casting a broad net in order to determine the ways in which problems co-occur in the experience of the IHS clientele.

Such activities might require increases in staffing and in funding but would more than repay the investment. Diagnostic tests may emerge that could be predictive. The large and heterogeneous sample that constitutes the clients of IHS might eventually constitute an important prospective longitudinal study, especially if, as is done in Washington State, a central registry is maintained, using multiple identifiers as insurance against the confusion of individuals.

Uniform reporting for admissions, recording of treatment, and other procedural regularization can improve the reliability of the data pool and lessen the likelihood that cases need to be dropped from the vast sample for lack of crucial bits of information. A data bank that handled information from throughout the system would become a rich lode for IHS and other researchers. Such a project would presumably pay for itself in terms of signaling regional and temporal changes in needs assessment and in spotlighting particular effective or ineffective programs and procedures. In immediately practical terms, clear, consistent, and up-to-date documentation of the severity and ubiquity of health problems among Indians would also be an effective tool for IHS to use in its recurring budget requests.

In response to the most recent data collected in the National Health Interview Survey (Wilson et al., this volume) and the Health and Nutrition Examination

Survey (Colliver, this volume), one could not help but be impressed at the sheer volume of quantitative data that had been collected. At the same time, however, we do not know whether there will be enough cases to yield meaningful analysis of drinking and its correlates among minority populations.

This limitation, articulated by the survey specialists themselves, prompts us to question the feasibility of continuing routinely to collect the data. In view of the high cost per respondent, a change in the approach of surveys seems appropriate to ensure that the data collected will be meaningful with respect to minority populations. One possibility would be to do more in the way of smaller surveys focused on specific ethnic populations, as was done in the Hispanic HANES. It is recognized that this in itself would be an ambitious venture, costly in time, effort, money, and other scarce resources. One way of funding such projects might be to abbreviate the core of the HANES that is so often replicated. Administering the overall HANES on a different cycle–perhaps using the full battery of questions only half as often–could allow for the development of a variety of other targeted surveys to fill gaps in our understanding of segments of the population and to address new questions. Our suggestion is not to do away with large-scale surveys, but to help make them more useful to the people who regularly rely on them and also to attract new users. It is to be hoped that any survey focused on a minority population would include an appreciable qualitative component to provide a meaningful cultural context for interpreting the quantitative data.

Most people who write about Indian drinking from an anthropological perspective have tended to emphasize patterns of belief and behavior that appear to be integral to the cultural system of the particular community under study. On the basis of long-term analyses of drinking and related social problems among Hispanics and Anglos as well as Indians in the Southwest, however, one anthropologist felt constrained to point out that "the vast majority of Navaho drunkenness, at least in Denver, can be accounted for *without recourse to the fact that the subject are Indians*" (Graves 1971, p. 307). He cited the complex of drunkenness, unemployment, police involvement, and so forth as being not so much features of Indian culture as features of the surrounding social structure that are similar for all who find themselves in the same disadvantaged, economically deprived class.

Although we have focused in the discussion on a variety of epidemiological factors, it could be argued that drinking is as much a symptom as a cause of problems among American Indians. When dealing with any minority population, recognition and acceptance of sociocultural differences must play an important role in any effort at understanding, preventing, or ameliorating such problems, regardless of whether researchers consider such problems to be etiological or consequent.

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Alaskan Natives and Alcohol: A Sociocultural and Epidemiological Review

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ABSTRACT

The authors review the sociocultural and epidemiological literature about Alaskan Natives and alcohol in the context of Alaska's history and political development. For nearly two centuries, the drinking patterns of Alaskan Natives were attributed to racial deficiencies and used to justify the prohibition against drinking. Beginning in the early 1950s, sociocultural studies of Native drinking challenged racial explanations by describing the many differences in drinking patterns among Native communities. At first, State policy regarded alcoholism solely as an individual problem to be solved by treatment, but later incorporated a community-wide response involving measures of local control. Epidemiological studies have documented the high toll taken by alcohol abuse, which is now the worst health problem for Alaskan Natives.

A variety of governmental instruments are now available to Alaskan Native communities for establishing control over the use of alcohol and for establishing alcohol-related programs. Future studies will determine the effects of self-determination on Alaskan Natives and alcohol.

Introduction

Alcohol has dominated the relationships between government and the indigenous societies of Alaska for over 200 years. Even today alcohol remains an important issue in the political development of Alaska. Much of the literature and lore about Alaskan Natives and alcohol attributed the drinking patterns to racial characteristics of the Natives. However, sociocultural and anthropological studies have tended to contest this viewpoint in favor of a variety of psychological, social, cultural, and environmental causes.

While addressing the subject of Alaskan Natives, it is appropriate to reiterate Westermeyer's (1981) warning that studies of alcoholism among Native Americans ignore the many differences among individuals and communities belonging to the same ethnic group. Alaskan Natives comprise 22 different ethnic groups residing in 250 villages spread out over a vast and varied landscape and constitute 15 percent (76,800 persons) of the total Alaskan population of 512,000. Despite important common elements, such as a subsistence economy based on the seasonal harvesting of fish and wildlife, each society has a different history and distinctive beliefs and behaviors.

This paper includes a review of (1) background materials; (2) theoretical and historical perspectives; (3) sociocultural studies; (4) epidemiological studies, i.e., data on apparent consumption, self-reported consumption, alcohol-related mortality, and adverse social indicators; and (5) community responses to alcohol problems. The extended bibliography following this review contains not only published works, but also agency reports, conference papers, and dissertations.[1]

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[1] The authors have prepared a computerized data base of the references that will be expanded to include other aspects of public health that are important to Alaskan Natives.

Background Literature

The Treaty of Cession of 1867, which transferred jurisdiction over Alaska from Russia to the United States, provided that the "uncivilized native tribes" of Alaska would be administered under "such laws and regulations as the United States may from time to time adopt in regards to aboriginal tribes of that country." Since that time, the fate of the indigenous societies of Alaska has been intimately tied to that of the American Indians.

Case (1978, 1984) described the special relationship of the U.S. Government to Alaskan Natives and the laws governing that relationship. The Alaska constitution has eclipsed Federal legislation in its effects upon the political and economic development of Alaska's native peoples. Fischer (1975) participated in the convention that drew up Alaska's constitution and described the concerns of the State's founders, who provided for strong forms of local and regional government in Alaska's rural areas.

In enacting the Alaska Native Land Claims Settlement Act of 1971 (ANCSA), Congress fulfilled its promise of 1884 to settle Native land claims, opening the State to a new era of development. Arnold and colleagues (1976), in a textbook treatment of ANCSA, described how the special relationship of the Natives to the land forged them into Alaska's most powerful political body.

Patterns of alcohol consumption are directly related to environmental health and health care. Fortuine's (1975) monograph reviewed the history of health care among Alaskan Native societies. Cutler and associates (1982) prepared a legislative report detailing the health-care delivery system for Alaskan Natives.

General background material on Native Americans and alcohol can be found in the bibliography of the anthropological and cross-cultural studies on alcohol use by Popham and Yawney (1967). Mail and McDonald (1977, 1980) produced a preliminary annotated bibliography on Native Americans and alcohol, to which Leland (1978) contributed commentaries. Street and colleagues (1976) published a selected annotated bibliography on alcohol use among Native Americans. Leland's (1976) *Firewater Myths* examined popular views of alcoholism among Native Americans.

Heath's works include a historical review of the anthropological (cross-cultural) studies on alcohol (1976*a*), a critical review of the ethnographic studies (nonwhite societies) of alcohol use (1975), an introduction to the anthropological perspectives on the social biology of alcohol (1976*b*), an overview of the epidemiology of alcohol use (1979), and a critical review of the sociocultural model of alcohol use (1980).

Directly related to Heath's work are Westermeyer's primer on chemical dependency (1976), a critique of the methods for investigating the epidemiology of substance abuse among indigenous societies of North America (Westermeyer et al. 1981), a book on the social aspects of alcoholism (Kissin and Begleiter 1976), a multidisciplinary work on alcoholism and drug dependence (Madden et al. 1977), and a review of the literature on alcoholism and Native Americans (Lewis 1982).

Alcohol and the Colonization of Alaska: Theoretical and Historical Perspectives

Ever since Emile Durkheim (1897) first wrote about the social functions of deviance, sociologists have been concerned with how definitions of deviance affect perceptions and behavior. By setting the boundaries between acceptable and unacceptable behaviors, groups create for themselves meaning, definition, and a sense of uniqueness and distinction (Wirth 1931; Lewin 1948; Lemert 1951; Becker 1963). Heath (1980) stated that the anthropological perspective has turned from the patterns of beliefs and behaviors characteristic of indigenous groups to the ways people define and maintain social boundaries between themselves and other societies.

Alcohol played a key role in the colonization of Alaska under the administrations of both Russia and the United States. Throughout North America, early traders used alcohol as a means of doing business and gaining political allies. The indigenous peoples of North America did not easily develop a taste for alcohol. From earliest times, many of them rejected alcohol and called for its elimination and control (Price 1975). Murton (1965) reported that the Russian-American Company exchanged rum for trade advantages. Eventually, whalers, fur traders, fish processors, soldiers, and prospectors in Alaska developed a seller's market for liquor and traded it for labor, sex, fish, and furs (Oswalt 1979). Many authors, including Mandelbaum (1965), Curley (1967), MacAndrew and Edgerton (1969), Kunitz and coauthors (1971), and Andre (1979), have claimed that current drinking patterns

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among the Native Americans reflect the binge-drinking patterns of the whites who first introduced them to alcohol.

Conn (1982*a*, p. 4) in his paper on the regulation of alcohol stated, "Thus, Natives received more than a taste for alcohol. They received a lesson in what was apparently the only comportment which flowed from drinking." Alcohol was perceived as a prized and rare commodity to be consumed rapidly and in its entirety whenever it could be obtained. The opposition of missionary-teachers and white officials to the use of alcohol among Natives seemed to support this perception. The long period of prohibition enforced on Alaskan Natives (1867-1953) blocked the assimilation of white middle-class drinking patterns.

Unable to control the liquor trade, the administrators of Alaska attempted to impose prohibition upon the Natives, a prohibition that was not to be lifted until 1953. Wheeler (1977) wrote of the efficiency of the United States in teaching the Natives how to distill whiskey and to brew beer. U.S. customs ships patrolled the immense Alaskan coastline in a fruitless attempt to control the lucrative importation of liquor and firearms. Enforcement of other laws protecting the Natives were generally ignored, while issues of liquor control dominated the relationships between the indigenous peoples and the military governors (Conn 1982*a*).

In 1884, Congress passed the Organic Act, which gave Alaska its first small measure of civil government. A governor was appointed and the area divided into four judicial districts. The act provided that the Natives were not to be disturbed in their use or possession of the land. In the late 1880s, the Alaskan Gold Rush began, and large numbers of whites came to settle in Alaska. New laws protected whites, further degrading Native health and economy. Alcohol was legal for whites in the district, but not for Natives, who were hunted and arrested for drinking. The government, becoming more dependent on liquor revenues, extracted stiff license fees from breweries and public houses, which exploited illegal trade with Natives.

In 1913, Alaska became a territory, with its own governor and legislature. In one of their first elections, Alaskans approved by a 2-to-1 majority a bone-dry prohibition law later ratified by Congress. The police were given enforcement powers, but extension of prohibition to the white population brought more bootlegging and moonshining. Liquor agents in Alaska were not able to keep up with the traffic, and in 1934, shortly after the repeal of national prohibition, Alaska's bone-dry law also was repealed, but only for whites (Smith 1973; Lautaret 1981).

During Alaska's territorial period (1913-1958), a series of well-publicized reports compared the shocking health conditions of Alaskan Natives to those in the most disadvantaged third-world countries. The publication of a blue-ribbon study, *Alaska's Health* (Parran 1954), caused public outcry and prompted Congress to establish a new system of health care for Alaskan Natives. Several Native hospitals were built or refurbished. An all-out attack on tuberculosis was mounted by training community health aides in each village to administer medication. The community health aides were to become the centerpiece of a network of health services that now include local clinics, regional hospitals, and the Alaska Native Hospital in Anchorage.

The period immediately after World War II was a turbulent time for Alaska. As a result of improved health care, mortality dropped and family size increased tremendously, breaking down traditional childrearing practices. Levit (1978) noted that during this period critical family relationships were compromised or destroyed as parents became more involved with alcohol. Long-term hospitalizaton for tuberculosis and large-scale exportation of youth to faraway boarding schools operated by the Bureau of Indian Affairs (BIA) contributed to the breakdown of family and cultural identity. Studies by Kraus (1972) and Resnik and Dizmang (1971) correlated the negative experience of Native children in BIA boarding schools to the dramatic rise in Native suicides during the 1970s.

Sociocultural Studies

The Federal health-care system helped the new generation of Native leaders to prepare for the important social and political changes that would come with statehood in 1959, the discovery of oil on Prudhoe Bay in 1968, and the Alaska Native Claims Settlement Act of 1971 (Cutler et al. 1982). While conducting work on other matters, early anthropologists observed the drinking patterns of the Alaskan Native societies (Thornton 1931; Denison 1949; Thompson 1951; Dale 1956). Later, scholars began to study drinking behavior as a primary subject of investigation.

In Parran's (1954) report, Lantis commented on the adverse relationship between the acculturation and the health of Alaskan Natives. Davis (1973) wrote about the effects of ethnic diversity on Alaskan Natives' drinking behavior. She suggested that health planning and efforts to reduce the incidence of premature death and preventable disease should be influenced by an understanding of the diversity of drinking behaviors and their meanings. Peterson (1972) noted that the relationship between sociocultural studies and therapy is not always clear, but that an understanding of the psychosocial forces affecting problem drinkers should help them to deal with their world.

Because of its northern climate, Alaskan Natives share many common health problems with those living in northern Canada, Greenland, Scandinavia, and the Soviet Union. Lantis (1968) discussed the effects of environmental stress on human behavior, while Stillner and Stillner (1974) wrote about the impact of climate on the provision of health care in Bethel, Alaska. In discussing the effects of the Arctic climate on the health of industrial workers in the North, Rey (1984) commented on how industrialization weakens the ability of indigenous Arctic communities to deal with the climate. Hanlon (1972) and Harrison (1970) emphasized this point when they listed poor nutrition, crowded housing, impoverished conditions, and alcoholism as contributing to the high rates of respiratory disease, otitis media, and injury and death due to cold.

In discussing the sociocultural explanations of alcohol abuse among Alaskan Natives, Fallon (1976) reviewed different authors' assessments of the concept of acculturation as a cause of Native drinking. Berreman (1956) studied the drinking patterns of the Aleuts of Nikolski and described the manner in which they adapted drinking behaviors first learned from the Russians. Berreman proposed that Aleuts drank not so much for fun as to relieve anxiety caused by "the plight of those who straddle two cultures" (Berreman 1956, p. 509). He drew on Lemert's theory of the "group" as the framework in which drinking behavior could be understood; he concluded that Aleuts did not display the alcoholic's sense of guilt over the consequences of drunkenness. He described their drinking behavior as "a reaction to, rather than a cause of, village disorganization and personal anxieties and frustrations" (Berremen 1956, p. 512).

Chance (1960) failed to see Natives as passive in the face of rapid social change. He attributed the successful acculturation of the Inupiat residents of Kaktovik to leaders determined to preserve their cultural identity and social organization as well as to a fortuitous set of circumstances. In his later work on the North Slope communities of Barrow, Kaktovik, and Wainwright, Chance (1966) agreed with Parker (1964) and Hippler (1969) that the loss of identity as a psychological problem has intense implications for the rates of suicide and alcoholism in Alaska. Schaefer (1975) emphasized the cultural and psychological conflicts caused by the importance of the individual in white society.

In a series of studies conducted in Native and mixed villages of Canada, Honigmann and Honigmann (1945, 1965) emphasized the beliefs, ethics, and meanings attached to drinking behavior. In one study, they related drinking behavior to the "differences in culturally patterned personalities" and tied the drinking patterns of the Natives to their child-rearing practices (Honigmann and Honigmann 1945, p. 581). In their 1965 study of how the Inuit of Frobisher Bay learned to drink, they proposed the "stake" theory of drinking: Those with less of a stake in the dominant culture tended to drink more.

Hippler (1973) argued that the Athabascans of Interior Alaska were in need of external controls to drinking and were able to overcome alcohol abuse by firm adherence to fundamentalist Christianity. Describing alcohol use in an Athabascan village, Brelsford (1977) related it to systematic patterns supported by economic, social, and religious factors. Bloom (1970) believed that many Native communities had been fragmented by acculturation, and the inability of Native persons to compete successfully in the marketplace led to despair and coping mechanisms such as alcohol abuse. Simeone (1978) connected the drinking behavior of Natives to their traditional potlatch festivals and shamanistic "time- out" rituals in which normal social inhibitions were suspended.

Drinking behavior may be more integrated into urban settings than rural ones and may be supported by more consistent attitudes and beliefs. Separate findings of an attitudinal study by Peterson and Heasley (1977) indicated that residents of rural areas (1) expressed considerably more disapproval of drinking, (2) were more inclined to regard alcoholism as a disease, and (3) were more apt to think that alcoholics drink because they enjoy drinking.

Although some sociocultural studies have discredited many of the stereotypes attached to Native drinking, they have often failed to define the "norm" in normative drinking, have ignored behavioral differences even within the same cultural group, and have mistaken correlations for cause-effect relationships. Related to the last point, social anthropologists have often ignored the *sources* of the anxiety to which they attributed unusual drinking behaviors, such as disease, poverty, malnutrition, and political domination (Heath 1980).

Epidemiological Studies

For a long time the concept of alcoholism as a disease was not generally accepted by the medical industry nor by the government in Alaska (Conrad and Schneider 1980; Mason et al. 1985; Richards 1984). Nonmedical groups, agencies, and individuals utilized the concept of alcohol as a "public health problem" and called for a continuum of treatment services. After Congress passed the Alcoholism Rehabilitation Act of 1968 and the Hughes Act of 1970, the Alaska Legislature passed the Uniform Alcoholism and Intoxication Treatment Act of 1972. In 1975, the State alcohol authority commissioned an epidemiological analysis to promote the implementation of the Uniform Act and its emphasis on alcoholism and alcohol as public health problems. The epidemiological approach to Native alcohol use, called the "new empiricism" by Colorado (1983), avoided the sociocultural debates concerning motivation and beliefs, concentrating instead on connections between quantifiable behaviors amenable to statistical analysis.

Apparent Consumption

The average annual estimated consumption in 1981 was 64 percent higher for Alaska than for the entire United States. This amounted to approximately 4.54 gallons of absolute alcohol per drinking age person in Alaska compared with 2.77 gallons for the United States as a whole. Furthermore, the rate of increase in annual estimated consumption was almost twice as high for Alaska as for the rest of the United States. The rate of annual increase in estimated consumption has slowed during the past decade in both Alaska and the United States, with only 6 percent of the increase occurring since 1971. Compared with national figures for people in the United States, Alaskans consumed a similar proportion of wine (about 13 percent) but more distilled spirits (44 percent versus 36 percent) and less beer (42 percent versus 51 percent) (Kelso and Fargnoli 1977*b*; Alaska State Office on Alcoholism and Drug Abuse 1984; National Institute on Alcohol Abuse and Alcoholism 1983).

Self-Reported Consumption

Although Alaska traditionally has been excluded from national drinking studies, there have been a few self-reported surveys of Alaskans that support comparisons of their drinking practices with national figures. However, no trend analyses are possible.

A self-report survey conducted in 1982 (Segal et al. 1983) regarding drug use by Alaskan adults included limited questions regarding the use of alcohol. The survey was conducted primarily by telephone and was based on a representative sample of adults from the three major urban areas and four hub-cities (communities of about 2,500 including surrounding villages). While about one-third of the national sample reported abstaining from alcohol during the previous year (NIAAA 1983), only 13 percent of the Alaskan sample reported no consumption of alcohol during the past year. Nationally, the prevalence of alcohol use was 22 percent higher for younger adults (ages 18-25 years) than for those over age 26, but in Alaska the prevalence of alcohol use was only about 8 percent higher among younger adults, 95 percent compared with 87 percent. The females of the Alaskan sample were as likely to drink as the males.

A 1981 survey of adults in Juneau and Ketchikan, part of an evaluation of a media program on alcohol prevention, found a high percentage of the adult population (82 percent) to be drinkers. About one-third were light drinkers (up to an average of 0.21 ounces of absolute alcohol per day), about one-third were moderate drinkers (0.22 to 0.99 ounces), and about one-sixth were heavy drinkers (more than 1.0 ounces). Compared with national surveys, this sample included about one-half of the percentage of abstainers, a similar percentage of light drinkers (Kelso and Wortham-Krimmer 1981). Compared with the United States as a whole, the prevalence of drinking in Alaska is higher, with less difference by age and no difference by gender.

While self-reports of consumption are limited for the general population of Alaska, even less information has been reported for Alaskan Natives. Natives represented only 5 percent of the Juneau and Ketchikan samples. In one of the drug surveys mentioned earlier (Segal et al. 1983), a condition for conducting the survey in rural communities was that data regarding ethnicity would not be collected.

An earlier assessment of health needs conducted within the municipality of Anchorage also included items on alcohol and drug use as well as ethnicity (Ender 1979). Instead of using comparable measures of alcohol use, the study used a crude scale defining alcoholism in terms of frequency of use, intoxication, and dependency. With these measures, Native residents were more likely to be classified as abusers and occasional abusers.

An analysis of self-reported consumption in a clinical sample of residential clients showed that the average daily consumption of Native males was lower than non-Native males, 6.3 ounces compared with 8.5 ounces of absolute alcohol, and that Native females consumed less than non-Native females, 4.5 ounces compared with 6.7 ounces. But Native clients were younger and much more likely to have been coerced into treatment, while non-Native clients were much more likely to have entered treatment voluntarily (Kelso and Fillmore 1984). Adjusted for age, Native males were more likely to consume less alcohol overall, to drink about the same quantities on each drinking occasion, to drink less frequently, to become drunk less frequently, and to drink to drunkenness on typical drinking occasions (Kelso and Personette 1985).

Mortality

Most of the available literature on Native Americans concerns alcohol and mortality. The age-adjusted crude death rate was consistently higher for Alaska than for the United States, 9.24 versus 8.6 per thousand in 1983. The death rate was almost twice as high for males as for females, 4.6 versus 2.9 per thousand. Native males had the highest rate, 7.85 per thousand, which was almost twice the rate for white males, 4.33 per thousand. The death rate for Native females, 5.31 per thousand, also exceeded that for white males. Native deaths accounted for 25 percent of all deaths, although Natives make up less than 15 percent of the population. Further, 26 percent of all Native deaths occurred before age 25, compared with 18 percent for whites (Alaska Department of Health and Social Services 1983).

Accidental deaths were the leading cause of death in Alaska, accounting for 23 percent of all deaths in 1983, compared with 4.5 percent for the United States as a whole. The accidental death rate was highest among Natives (1.46 per thousand), particularly Native males (2.07 per thousand), compared with white males (1.14 per thousand), all Alaskans (0.82 per thousand), and the United States as a whole (0.39 per thousand) (Alaska Department of Health and Social Services 1983).

The rate of death due to alcoholism was also consistently higher in Alaska than the national rate. It increased from 0.045 to 0.114 per thousand from 1959 to 1975 and generally remained at this rate until 1983, ranging between 0.101 and 0.117 per thousand (Kelso and Fargnoli 1977*b*; Alaska Department of Health and Social Services 1976-1983). The alcoholism death rate for Alaskan Natives was consistently higher than for whites. During the period from 1978 to 1983, it ranged from 0.30 to 0.36 per thousand for Natives and from 0.06 to 0.08 per thousand for whites. The alcoholism rate for all American Indians and Alaskan Natives was about 0.38 per thousand in 1979 and 0.45 per thousand in 1978. Although the alcoholism rate for American Indians and Alaskan Natives combined seems to have been declining gradually since the late 1970s (Mason et al. 1985), the rate for Alaskan Natives has remained fairly constant. Alaskan Natives accounted for a disproportionate share of deaths due to alcoholism, an average of over 52 percent from 1974 to 1983 (Kelso and Fargnoli 1977a; Alaska Department of Health and Social Services 1976-1983).

Alcohol-Related Suicide

An annotated bibliography on suicidal behavior among American Indians, Alaskan Natives, and Canadian Indians contains 65 citations of published works of an anthropological, psychological, or medical nature (Peters 1981). A review of the literature about suicide among Native Americans, introduced by a discussion of the theoretical basis of suicide research, provided a sociocultural introduction to the subject of alcohol-related violent deaths among Alaskan Natives (Levit 1978).

In a series of reports, Kraus (1971, 1972, 1974*a*,*b*, 1978) and Kraus and Buffler (1974, 1976) presented their findings on suicide behavior in one town of 2,000 inhabitants. A rate of 14.5 per thousand was reported for the year 1970, compared with 1.47 per thousand for the city of Los Angeles. Kraus (1974*b*) identified four significant factors in 38 Eskimo suicides between 1950 and 1970: sibling order, institutionalization for tuberculosis, alcoholism, and a boarding school education.

Kraus and Buffler (1976) attempted to construct a model of suicidal behavior that would take into account cultural, social, and psychological factors. Suicide rates among Alaskan Natives were relatively stable from 1950 to 1965, increased steadily from 1965 to 1969, and then doubled during the last interval, exceeding the white rates for the first time (0.15 per thousand). The increase was attributed to persons in the 15-24 year age group, with persons in the 25-34 year age group experiencing the next largest percentage increase. The increase from 1966 to 1974 was more prominent for females. The rates among the various

Native ethnic groups varied, with Athabascans most at risk, with a rate of 0.878 per thousand for the period 1970 to 1973.

Kraus and Buffler (1976), comparing mortality rates for various causes of death, showed that Native deaths due to alcohol and suicide rose precipitously from 1955 to 1959, while Alaskan non-Native deaths in the same categories declined during this period. Violent deaths, defined as accidents, homicides, and alcoholism, were the leading cause of death in Alaska. The authors found that the rising rate of accidents among Alaskan Natives paralleled that of American Indians generally, but from 1966 to 1974, suicide rates sharply exceeded those for American Indians and rates for the United States as a whole.

A report prepared for the Alaska Native Health Board (Blackwood 1978) studied suicides among Alaskan Natives for roughly the same period (1950-1975) as the Kraus and Buffler studies, but specific analyses were used. Unlike the general trend for the country, the highest suicide rates and the greatest percentage increase in suicide rates were found in the 15-24 and 25-34 year age groups. When controlling for sex, however, the proportion of male suicides increased with age, exceeding that for the total United States population.

Travis (1983) studied Native suicides in the Northwest Alaska Native Association (NANA) Region from 1960 to 1979. In spite of the fact that no suicides took place during the 1960 to 1964 period and that the rate was only 0.119 per thousand for the period of 1965 to 1969, the suicide rate for the 1975 to 1979 period was 0.909 per thousand, or seven times the national average. The important factors associated with the dramatic increase from the early 1960s to the late 1970s in this region were the loss of family and friends, relationship problems, death of a close individual, and a sense of loss or failure. Travis stated that alcohol abuse was more a facilitator than a cause of suicide, but 86 percent of suicides and suicide attempts were related to alcohol, a rate higher than in other Native American societies. Travis (1984) also pointed out the notable difference in suicide rates in the 1970s between the Inupiat Eskimos in the NANA region of Alaska and those in the adjacent North Slope Borough, attributing the higher rate of suicide in the NANA region to an economic decline and a higher level of unemployment.

A more detailed view of suicides in Northwest Alaska (Schall, n.d.) described the number of social changes affecting the health of the region since 1940. The self-destructive events under study from 1965 to 1971 were 4 suicides and 22 suicide attempts, averaging out to a rate of 1.94 per thousand for the attempts and 0.947 per thousand for the suicides. Schall noted 10 events in the 15-19 year age group, which constituted 13.6 percent of the population but 38.5 percent of the events. A total of seven combined suicides and attempts occurred among the 20-24 year age group, representing 9.8 percent of the population but 26.9 percent of the events. Schall attempted to test theories that related childhood education patterns to suicide by using racial composition, sibling order, and adoption as indices of traditional upbringing, but found no statistical significance attached to any of the indices.

Parkin (1974) compared suicidal behavior of non-Natives, Eskimos, and Athabascan Indians in Fairbanks between 1960 and 1971. In 1970, although Natives made up only 6 percent of the population, Native females accounted for 38 percent of all female suicide attempts, and Native males accounted for 18 percent of all attempts.

Self-inflicted gunshot wounds were responsible for 75 percent of the suicides among Alaskan Natives during the period 1976 to 1980. Kost-Grant (1983) reviewed the psychiatric consultations for 34 Alaskan Natives who had survived self-inflicted gunshot wounds. He found 20 of the 28 males in the study had been using alcohol at the time of the shooting. Kost-Grant concluded that cultural inhibitions of verbal expressions of aggression may have contributed to the self-destructive behavior.

Hippler (1969) published a cross-cultural study of suicide, stating that aggression was clearly implicated in Eskimo suicide. He blamed the "immediate gratification orientation" of Eskimo child-rearing practices for making it difficult for adults to deal with feelings of aggression. Others have suggested that this aspect of Eskimo personality may be linked to suicide (Parker 1962; Chance 1966; Parkin 1974).

Kraus (1974*b*), citing Weyer (1932), Rasmussen (1931), and Leighton and Hughes (1955), stated that suicide was common in traditional Eskimo culture and supported by cultural beliefs. Contemporary patterns differ in that suicides among youths (ages 15-25) are more frequent than among older men; suicides are abrupt, unexpected, and usually connected with alcohol; and, because they diverge so from traditional patterns of suicide, they are regarded as deviant and shocking. A State of Alaska memo published by the Division of Public Health (Tirador 1983) compared suicide rates from 1975 to 1981. The analysis showed a downward trend among Alaskan Natives from 43 percent to 18 percent of all Alaskan suicides. American Indians exhibited a similar downward trend nationally.

Social Indicators

Foulks and Katz (1973) surveyed the problem of psychiatric illness and alcohol abuse by analyzing the discharges from the seven Alaska Area Native Health Service (AANHS) hospitals during 1968. They found alcoholism to be the most prevalent mental disorder in all the Native groups and to have a special prominence among Athabascan Indians and Aleuts. Mental disorders of all types were more prevalent in the larger rural towns than in the more traditional villages. Among the total of 464 cases, 54 percent of the Native hospital admissions had a history of difficulty with alcohol, and 26 percent of Native patients had a history of suicidal behavior.

Using the records of the AANHS hospitals, the Community Health Centers, and the Alaska Psychiatric Institute, Kraus and Buffler (1979) analyzed the trends of psychiatric illness and alcohol abuse among Alaskan Natives during the period 1971 to 1977. They noted that admissions to the Indian Health Service hospitals rose from 5.7 percent to 8.1 percent from 1971 to 1976 and then dropped to 6.5 percent in 1977. Inpatient admissions for alcoholism, however, continued to increase in 1977. They speculated that the drop in hospital mental-health admissions may have been due to more Native use of the Community Mental Health Centers in 1976 and 1977 for short-term treatment. But during the same period, the number of State-funded community alcohol programs also increased rapidly.

Alaskan Natives had a very high rate of fatal and nonfatal accidents. The number of accidental injuries treated during the period 1971 to 1977 increased from 10,043 to 14,611. A range of between 12 and 19 percent were alcohol related. Outpatient admissions for suicide attempts during the same period ranged from 104 to 161 per year with rates ranging from 2.05 to 3.02 per thousand and a high percentage alcohol related (43.3 percent to 59.7 percent). Inpatient admissions for suicide attempts ranged from 90 to 129 per year, with rates from 1.00 to 2.51 per thousand during the same period. Combined inpatient and outpatient rates for the high year, 1973, came to 5.18 per thousand (Kraus and Buffler 1979).

Records of the Alaska Psychiatric Institute, the only public mental health hospital in the State, indicated that Native admissions during the period 1973 to 1977 varied from 184 to 227, with an average rate for the period of 3.41 compared with 1.39 for whites. Analysis of the data according to the 12 ANCSA Native regions indicated that in 4 regions (Arctic Slope, Cook Inlet, NANA, and Doyon) more than 10 percent of the Native individuals living in each area received treatment for mental illness or substance abuse. The data indicated that 8.3 percent of Alaskan Natives received treatment in 1977 (Kraus and Buffler 1979).

Admissions to State-funded alcohol treatment programs increased by over 400 percent during the past decade, from 2,474 in 1975 to 12,426 in 1984. Ten years ago, most of the admissions were for inpatient/residential care, but during 1984 these admissions accounted for only about 12 percent of all admissions. Nonetheless, Alaskan Natives have consistently accounted for about 60 percent of these admissions, which considerably overrepresented their share of the population (Kelso and Fargnoli 1977*b*; Alaska State Office on Alcoholism and Drug Abuse 1985). Furthermore, while 61 percent of the non-Native admissions were voluntary, 61 percent of the Native admissions involved coercion by a legal or social-service agency (Kelso and Fillmore 1984).

A survey of arrests in Anchorage in 1969 found that 54 percent (1,300 persons) of the 4,327 arrests were for being drunk in public, and 53 percent of those arrests were Alaskan Natives. Out of the 1,300 arrests, 37 percent of the individuals involved accounted for 71 percent of all the drunk-in-public arrests (Wilson 1969).

Whites and Alaskan Natives were compared in a survey of criminal offenders and alcohol-related offenses based on a statewide sample of 258 interviews of inmates (Hill 1975). More Natives than whites were arrested for alcohol-related offenses, with Natives responsible for 83 percent of all alcohol-related offenses. The charge of being drunk in public accounted for 30 percent of all Native arrests, compared with 16 percent of white arrests. Natives were also overrepresented in charges directly involving alcohol (54 versus 16), and whites were overrepresented in charges that did not involve drinking (27 versus 8). The high arrest rates of young (31-year-old average) drinking Natives may be attributed to discrimination. Police disputed this interpretation and insisted that drunken offenders were arrested for their own protection.

The Alaska Division of Corrections reviewed material from several reports covering the period 1969 to 1974 to evaluate the impact of alcohol abuse on the criminal justice system and the effects of the passage of the Uniform Alcoholism Act (Hill 1975). The study of sentencing reported that, in a 6-month sample, Natives accounted for 50 percent of the sentencing statewide and 48 percent in Anchorage, with Natives also accounting for 62 percent of the alcohol-related offenses. Natives accounted for 52 percent of those released in 1971, but also accounted for 72 percent of recidivism.

The report stated that there was a significant drop in the proportion of offenses that were alcohol related in the period 1971 to 1975, from 34 percent to 7 percent of all offenses, representing a 73 percent decrease for Natives and a 49 percent decrease for whites in alcohol-related offenses. "At the time of passage of the Uniform Alcoholism Act," the report read, "it was widely observed that the charge of Drunk-in-Public was, *de facto,* discriminatory against the Native population (Hill 1975, p. 10). With passage of the Act in 1972, it was anticipated that both numbers and proportion oı Natives in correctional custody would decrease. After passage of the Act, the proportion of all cases of Native arrests decreased (from 53 percent in 1972 to 37 percent in 1974), and the proportion of white arrests increased (from 43 percent to 56 percent) in the same period. This change may have been partly the result of the large influx of whites during the period of pipeline construction.

In the same review, a separate survey of 103 inmates indicated that all violent crimes committed by Natives and blacks took place when the offender had been drinking. Some 75 percent of the Natives reported having had a serious problem with alcohol, compared with 47 percent of whites and 17 percent of blacks. In contrast, 42 percent of blacks, 37 percent of whites, and 13 percent of Natives reported having a drug problem. The study concluded that the proportion of Native offenders in the correctional system far exceeded their presence in the general population and that these offenders were more involved in minor offenses than in serious crimes.

Kelso and Fargnoli (1977*b*) indicated that most of the alcohol-related arrests came from misdemeanor offenses. Offenses considered 100 percent alcohol related (driving while intoxicated, liquor-law violations, drunkenness, nonaggravated assaults, disorderly conduct, and vagrancy) accounted for 39 percent of all the arrests in the State from 1973 to 1975. While the greatest number of these arrests were in urban areas, in the larger rural towns almost one-half of all arrests were alcohol related. Seventy-six percent of all cases referred to residential treatment by agencies of the criminal justice system were Natives (Kelso and Fillmore 1984), again illustrating the overrepresentation of Natives in alcohol-related offenses.

Community Responses

Until the adoption of the Uniform Alcoholism and Intoxication Treatment Act of 1972, there was no clear policy statement on alcohol in Alaskan legislation. This Act decriminalized intoxication and provided for treatment and rehabilitation of people suffering from alcoholism. Other laws, however, were not changed to reflect the public health concerns of the Uniform Act. This situation caused important policy conflicts between the control of sales on one hand and the control of abuse on the other. Statewide regulations, licensing procedures, and the ABC Board regarded alcohol as an important industry, whereas the Uniform Act regarded it as a dangerous drug. The legislature acknowledged alcohol as a public health hazard but did little to reduce sales. Legislation favored local control over the sale of alcohol but failed to enable the municipalities to fully exercise that power (Kelso and Fargnoli 1977*a*).

Community Control

Alaskan Natives generally have been inconsistent in their attitude toward the concept of alcoholism as a disease (Peterson and Heasley 1977). Traditional norms dictated noninterference with another person's behavior unless it became a problem for the community. While there has been some support for community controls on the supply of alcohol, Natives generally deplore the use of the criminal justice system to correct alcohol-related problems. Because of social and familial bonds, Natives generally prefer that the drunk offender be removed and jailed if necessary, without bringing formal charges (Hippler and Conn 1975; Conn 1982*b*).

During the 60 years preceding statehood, the village councils were the mainstay of institutionalized village government in Alaska, resolving conflicts and administering a mixture of Anglo-American and Native law. The village councils developed complex legal and cultural traditions that made them key institutions in the development of the bush justice (Hippler and Conn 1975). Some of them devoted considerable effort to controlling liquor traffic. Although many of the ordinances were poorly drafted and sometimes violated Federal law, territorial officials and the police cooperated in enforcing the ordinances.

After the 1953 repeal of Federal legislation prohibiting alcohol use among Native Americans, the Bureau of Indian Affairs encouraged village councils to use their fining and jailing powers to keep the villages dry (Conn 1982*a*). However, the new Alaskan Constitution provided for a centralized judicial system, which made such activity by the village councils illegal.

Statehood brought major reforms in law enforcement throughout rural Alaska. With respect to control of alcohol, however, the second-class villages were strapped without authority. In order to control liquor traffic, village councils were thrown back on their own resources, which had been greatly diminished by State law. Conn (1982*b*, p. 18) wrote: "The promised support of state law in the realm of alcohol control focused exclusively upon problems which had already begun and not on the presence of liquor as a source of trouble." The State offered a set of statutes and regulations based on the assumption that liquor use by adults was the norm and that deviant behavior was an exception to be checked by the criminal justice system. "The logic of the State's position was so at variance with the legal traditions of the village councils that the councils' role in social control was sharply limited and even foreclosed. . . ." (Conn 1982*b*, p. 58).

After the decriminalization of public drunkenness in the early 1970s, the first-class cities such as Barrow were able to respond with the use of "protective custody" (i.e., civil arrest) of inebriates, justified by the need to protect them from freezing to death (Moeller 1978; Sellin 1980). Second-class villages were limited to emergency powers that enabled them to ban alcohol for periods up to 90 days. In some towns, this provision was invoked on a regular basis, such as during fishing seasons, on other occasions when more whites would be present, or during celebrations.

In 1977, the State legislature, in response to appeals from the villages, conducted a series of hearings on the matter. In 1981, the legislature revised the Local Option Law, which allowed village governments to choose by vote one of these options: (1) selling liquor only with a selected liquor license, (2) operating a community-owned bar or liquor store, (3) stopping the sale of alcohol, or (4) retaining the status quo (Lonner and Duff 1983). To date, over 60 rural villages have voted to ban the sale and import of alcoholic beverages under this law. An unexpected result of this law was that alcohol problems were transferred from villages to regional centers such as Kotzebue, Nome, and Bethel.

Village Alcohol Programs

Several studies have examined the community response to alcohol problems in two Yupik Eskimo villages on the Yukon-Kuskokwim Delta. Community perspectives on alcohol and treatment have been examined as well as epidemiological data on drinking. In River Village, the villagers identified 78.5 percent of their residents as abstainers, 14 percent as nonproblem drinkers, and 7.5 percent as problem drinkers. In Sea Village, the breakdown was 41 percent abstainers, 35 percent nonproblem drinkers, and 24 percent problem drinkers (Shinkwin and Pete 1982).

Jones and coauthors (1981) emphasized differences in alcohol control within each village, both of which had a village alcohol board and alcohol counselors. In River Village, the counselor initiated a flow system for abusers that encouraged cooperation between the police and the city council. In Sea Village, the system relied much more heavily on the police and the magistrate. As a result, fewer people were willing to sign complaints.

The Yamashiro (1981) report on the same villages cited outside influences affecting alcohol use, including failure of the State to back up and help enforce local alcohol policies and ordinances. In Sea Village, the State appointed a village resident to be magistrate, started a police force, and built a jail and courthouse. With these introductions, State authorities expected the village would administer State law in the national fashion. In that village, the magistrate system and the village council were not integrated, nor were there guidelines on how they were to relate to one another. These undefined relationships, according to Yamashiro, prevented both from working well.

Three Alaskan Native alcohol counselors who had received standard professional training were subjects of another study (Shinkwin and Book 1982). That study concluded that the more counselors deviated from medical concepts of disease and treatments, the more effective they were. They also discovered that counselors who used more effective techniques burned out more quickly. The authors recommended a community-management approach involving many levels of community support.

A study of alcohol problems and community responses sponsored by the Norton Sound Health Corporation (Kelso and Knoohuizen 1980) commented on how alcohol problems were described and handled by formal agencies. The majority of agents were highly aware of individuals' alcohol-related problems because they spent a great deal of time dealing with them. Agents seemed unwilling, however, to involve the community in alcohol problems. They also tended to avoid those aspects of the client's problems outside their professional competence. This resulted in "passive" treatment whereby the agent waited for the client to seek help with a drinking problem. The authors attributed this passivity to the overwhelming incidence of alcohol problems and the need to delay the rapid and inevitable burnout. The passive attitude also may have reflected a general belief that abusive drinking was a symptom of much wider social problems in the community (e.g., lack of employment and recreational opportunities, isolation, and harsh climate). Many thought that alcohol problems were beyond the reach of their individual efforts. Most agents preferred to hold the alcohol regulation authorities and the correctional systems accountable for the problems.

Because of the magnitude of alcohol-related accidents that occur inside the home, Conn and Boedeker (1982) compared inside-the-home and outside-the-home incidents in two towns, Barrow and Bethel. The authors chose these cities because of the similarities in size (both about 3,000 inhabitants) and function (both serve as regional centers). Each town has banned the sale but not the use of alcohol. In Bethel, police pick up intoxicated persons and transport them to a sleep-off and treatment center. In Barrow, police take them into protective custody.

The authors felt that the difference in this control measure might affect how and where alcohol-related accidents occur in rural areas. It was found that in Barrow, more alcohol-related accidents took place in the home (42 percent compared with 33 percent in Bethel and 28 percent statewide). The data also indicated that in Barrow the home was more likely to be the setting for personal violence (56 percent as opposed to 46 percent in Bethel and 32 percent statewide). In both Barrow and Bethel, private homes were a haven for residents who wanted to drink. However, in Bethel the percentage of all the accidents occurring inside the home was 14 percent lower than in Barrow, and the incidence of alcohol-related purposefully inflicted violence was 9 percent lower. In Bethel, 29 percent of all the town residents were transported at least once to the center during the period of the study, 1977. The authors suggested that because Bethel police do not use protective custody, which is often regarded as punitive, residents were more inclined to call on police for transportation to the sleep-off center.

A study of law enforcement incidents in three villages served by the Kuskowkim Native Associaton (KNA) in the period from May 1981 to April 1982 (Marshall 1983) was compared to a 6-month study conducted in the same area in 1979 (Marshall and Soule 1980). It is significant that the annual rate of incidents in the later study was half of that in the earlier study. Unlike the 1979 study, data from the later study did not indicate that the proximity or accessibility of a village to alcohol was correlated to incidents.

One explanation for the decrease in incidents reported by the KNA study is that the staffing pattern of the KNA Community Counseling Center changed. The director, a non-Native who originally worked alone, was joined by three full-time staff members, two of whom were Native paraprofessionals. State troopers' coverage of the area increased from one to two. Finally, deterrence was increased by changes in the Alaska Criminal Code in 1980 that set maximum and minimum terms of imprisonment and fines. These epidemiological studies point out the degree to which community perceptions and responses affect both drinking and definitions of drinking problems in rural Alaska.

Commentary

The arrival of a measure of self-determination among the indigenous societies of Alaska has been accompanied by a steady drive for local control of alcohol and alcohol programs. The inclusion of alcohol-related problems into a larger set of social problems has supported this decentralization. The social, economic, and political context, once regarded as the source of an unalterable stress contributing to abusive drinking, now provides Alaskan Natives with more opportunity to reduce and control alcohol use and abuse.

Alaskan Natives have used a number of forms of government to develop political power. Besides the traditional village councils and the councils chartered under the Indian Reorganization Act (IRA) of 1934, most villages have some form of State-chartered or home-rule municipal government. There are two regional IRAs in Alaska and about 70 IRA village governments. The Alaska Native Claims Settlement Act created 13 regional and 209 village profit corporations (1) to administer ANCSA settlement lands and grants and (2) to engage in economic development. Besides operating local businesses such as stores, the corporations often provide various quasi-governmental services such as fuel supply, sanitation, and public housing. There are 11 regional Native nonprofit corporations, which (outside the North Slope Borough) also operate as quasi-governmental agencies, contracting with the State and Federal agencies to provide medical and social services in their respective areas (Morehouse et al. 1984). Some villages have experienced a virtual merger of the IRA council, the municipality, and the ANCSA village corporation. Most often, however, there is a division of services and personnel according to age, education, and political persuasion.

Although annual per capita consumption of alcohol for all Alaskans is comparatively high, the small amount of existing epidemiologic data on the use of alcohol by Alaskan Native societies indicate disproportionately high rates of alcohol-related mortality, hospital admissions, accidents, criminal arrests, and incarceration. The larger body of sociocultural literature argues that excessive drinking by Alaskan Natives is related to the effects of rapid social and economic change and the breakdown of traditional controls following contact with whites. More recent studies have focused on the efforts of Native communities to establish local control over the sale, possession, and use of alcohol, as well as the rehabilitation of abusers and alcoholics.

Most Alaskan Native societies have chosen a political path quite distinct from that of Native Americans in other parts of the country. They have historically rejected reservation status in favor of nonexceptional forms of local, regional, and State government. They have also utilized a variety of political instruments such as State-chartered profit and nonprofit corporations as well as federally chartered tribal governments as part of a more active approach and level of participation in the management of social and economic change. The political, economic, and social diversity of Alaskan Native societies provides a unique laboratory for alcohol studies. Future studies will be able to examine the relationship between variations in community control and participation in the political, economic, and social structures and the use of alcohol and alcohol-related consequences.

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Epidemiology and Correlates of Alcohol Use Among Indian Adolescents Living on Reservations

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ABSTRACT

Indian adolescents are compared with their non-Indian counterparts for lifetime prevalence, recent use, age of first use, and daily use of alcohol over the past 10 years. Sex differences between and within the samples also are examined. Exploration of the relationship between alcohol use and the use of other drugs shows similarities and differences between the use of alcohol and various other licit and illicit substances. A further understanding of the context of alcohol use is provided by showing the relationship of alcohol use to a variety of psychological and social factors. General domains of interest include cultural identification, family relationships, school adjustment, peer encouragement and sanctions, personal adjustment, tolerance of deviance and deviant behavior, and expectations for the future. Implications for interventions are discussed briefly. The final sets of data provide insights into the reasons or rationales Indian adolescents give for their use of alcohol and the specific social contexts in which alcohol is used. These data sets are especially useful in understanding the forces that initiate and perpetuate Indian adolescent alcohol use.

Introduction

Alcohol abuse among American Indians is a topic long on opinion but short on empirical findings. Many opinions reflect stereotypes that conjure up images of carefree nomads reneging on the responsibilities of modern life and whiling away their time by drinking. These stereotypes are so ingrained that even serious investigators must work diligently to suspend many preconceptions developed over the years. Leland (1976) identified a number of "firewater myths" that purport to explain Indian drinking. After extensively analyzing the evidence marshaled to support these myths, Leland concluded that little substantiates them. On the other hand, it is difficult to avoid the conclusion that alcohol leads to grave consequences for Indian communities. Based on a review of a wide range of indices, the American Indian Policy Review Commission (Snake et al. 1976) stated before Congress that alcohol abuse leads to 90 percent of all Indian problems. Granted, this may be an overstatement, but it is still a powerful indictment!

Perhaps the most common notion yet to be carefully examined is that nearly all Indians misuse alcohol. Recently, this idea has taken on a physiological slant that postulates that Indian people are genetically predisposed to alcoholism. Actually, this is only a variant of a much longer-standing theme that Indian people are inherently unable to control their alcohol consumption.

Little evidence exists to document the extent of alcohol use among Indians. Most studies have been designed to examine a particular hypothesis about why drinking occurs and rarely have been replicated beyond a single location. Although prevalence data have been collected, little attention has been paid to the methodological consistency necessary to support cumulative or cross-sectional research on the extent of alcohol use among Indians. May (1982) found only four studies that might potentially apply to large numbers of Indian adults. Because two of these showed that more Indians used alcohol than non-Indians and two showed that fewer Indians used alcohol, any conclusion related to alcohol use among Indians and non-Indians is impossible. May speculated that whereas fewer Indians may actually use alcohol, their styles of drinking, particularly very heavy drinking by those who do drink, may lead to the much higher rates of alcohol-related problems (accidents, homicide and suicide rates, alcohol-caused medical problems, and others) reported by the American Indian Policy Review Commission.

Even less information exists in the literature about drinking among Indian youth. Again, nearly everyone has agreed that adolescent drinking is a serious problem, but supporting data have been scarce. In an attempt to remedy this, we have been involved in a long-term, NIDA-funded project to survey alcohol and drug use among Indian youth, the results of which are reported in this paper. For nearly 10 years, a consistent methodology has been used to assess the extent and patterns of alcohol use and the use of other chemicals by reservation youth.

Sampling Procedure

Our basic procedure is as follows. Each year we identify five or six tribes from different parts of the country that we believe are sufficiently diverse geographically, culturally, and socioeconomically to contribute to a representative sample. We then enter into negotiations with these tribes and work through the many levels of approval that are needed. Most often we are able to obtain data from the selected tribes, but for various reasons some are unable to participate. In these cases we select other tribes, as similar as possible, to complete the sample.

Once our negotiations are complete, we arrange to survey all the Indian youth enrolled in the 7th-12th grades in the different reservation schools. The surveys are anonymous and take 30 to 40 minutes to complete. Completed surveys are sent to our laboratory, where results are compiled, after which each school and tribe is sent an individual report. We then combine data across tribes for our research purposes. (We have an agreement with each tribe that we will never disseminate individual results without permission. We do, however, assist serious investigators in obtaining tribal permission if they have a legitimate need for data on specific tribes.)

This is not an ideal sampling procedure. It is stratified geographically, but the exigencies of political and financial reality prevent construction of a technically representative sample. The results, however, have proved to be more accurate and reliable than we might have expected them to be. Despite the limitations of the sampling procedure, we have been able to build a picture of alcohol and drug use among Indian youth that we believe is reasonably representative of what is happening with Indian youth who live on reservations. This belief is based on several factors: (1) the data are very consistent over time–a sample of tribes from one year yields results very similar to a different sample of tribes taken the next year–thus suggesting both samples were reasonably representative; (2) changes in repeated surveys of the same tribe match samples from different tribes obtained at the same time; and (3) although Indian youth generally have higher rates of use, their trends across time parallel national trends of alcohol and drug use of non-Indian youth.

The surveys designed for this study ask a series of questions about the use of alcohol and 13 different drugs. The questions also elicit information on psychological and social characteristics of young people. The information used in this article is extracted from this large data pool.

Comparison Groups

The data on Indian youth alcohol use are presented in comparison with several non-Indian groups. Precisely parallel data from national samples of non-Indian youth are not available due to variations in sampling procedures and item comparability and other methodological differences. Sampling methods used in the two major national long-term data sources–the National Household Survey (Miller et al. 1983) and the National Senior Survey (Johnston et al. 1984)–are not applicable to the study of Indian epidemiology. The major barrier to paralleling these studies is the status of Indian tribes as independent nations. It is unethical, and in some cases illegal, to randomly survey members of many different tribes without securing specific permission of tribal authorities at each location, an impractical procedure. Therefore, this research uses a carefully selected sample of tribes rather than a sample of households or individuals across tribes. Despite differences in sampling procedures, the results can be compared to national data to the extent that the different methods draw representative samples of their respective populations. Although the two national surveys have their own limitations, they provide a solid data base across the past decade that is useful in examining trends. The procedures used in this paper appear to yield equally reliable trend data for Indian youth.

Over the years, we have constructed incidence and prevalence questions that yield data comparable to that obtained from the national surveys. These questions were used to gather extensive data from a moderate-size, Western, non-Indian community. This community is representative of youth nationally on many alcohol- and drug-related dimensions and therefore provides another reasonable "non-Indian" comparison. In sum, the study uses three comparison groups: the 12- to 17-year-old sample from the National Household Survey (Miller et al. 1983), the 12th grade students from the National Senior Survey (Johnston et al. 1984), and the Western non-Indian community (Oetting et al. 1982). Sex and age distributions of the Indian sample and the three comparison groups are comparable (table 1). Although these data are for only 1 year of the Western, non-Indian sample, similar results were found across all years.

The Context of Alcohol Use by Reservation Indians

In examining alcohol use of Indian youth, it is important to consider several unique contextual or environmental differences that may affect how alcohol is used and viewed. Because of both historical and contemporary prohibition, the availability and distribution of alcohol among Indian youth who live on reservations is quite different from the rest of the United States. Until 1953, Federal law prohibited the sale of any type of alcoholic beverage to Indian people on or off the reservation. Sequelae to historical prohibition are both behavioral and attitudinal. The often cited description of "Indian drinking," in which groups consume large amounts of alcohol in a short period of time, may have originated from the attempt to avoid being "caught with a bottle." Prohibition also may help to explain why alcohol traditionally is not kept in the

Table 1.—Sex and age distribution of the Indian and comparison samples

Sample	N	Sex Male (percent)	 Female (percent)	Age 12-13 (percent)	 14-15 (percent)	 16-17 (percent)	 18+ (percent)
National Household Survey[a]	1,581	52.5	47.5	32.6	32.3	35.1	0
National Seniors Survey[b]	15,900	49.6	51.4	[d]	—	—	—
Western community seniors[c]	770	49.9	50.1	[d]	—	—	—
Indian adolescents	2,164	51.7	48.3	35.9	34.6	23.5	6.0
Indian seniors	185	49.2	50.8	[d]	—	—	—

[a] Miller et al. (1983).

[b] Johnston et al. (1984).

[c] Oetting et al. (1982).

[d] High school seniors only in these samples.

homes of Indian families but, instead, is ordinarily purchased and consumed within a short period of time. Although Federal prohibition has long been lifted, the pattern of alcohol use that evolved persists and is reinforced to a degree on some reservations that continue prohibition.

Many reservations legally prohibit the sale of alcohol; others even ban possession within reservation boundaries. These restrictions lead to clandestine activities to obtain alcohol, including thriving bootlegging operations and routine "runs" to reservation border towns to purchase or consume alcohol. The latter practice concentrates observable alcohol-related activities by Indians in these towns and often feeds the stereotype that Indians are preoccupied with alcohol use. Less visible to observers are the Indians who remain on the reservation and have little to do with alcohol.

Perhaps more important than the patterns of alcohol use engendered by prohibition are certain attitudes that have developed. A selective banning of sales and even use for a particular ethnic group must have some effect on one's perceptions. Selective prohibition reaffirms the longstanding stereotype that Indian people "can't hold their liquor" (Leland 1976) and causes some resentment toward a paternalistic policy that, based on ethnicity alone, grants rights to some people but not to others. Rogin (1975) details many ramifications of the "father and child" relationships non-Indians have structured in their dealings with Indian people. People who are told continually that they are not capable of controlling their own behavior regarding alcohol may, over time, begin to believe that message.

Indian youth in particular must develop some peculiar attitudes about drinking and about their own ability to make choices about their behavior. Some Indian young adults fatalistically feel they must drink in order to be "real Indians." Once this group identity is established, it is very difficult to resist alcohol for fear of not belonging. Conversely, other Indian youth reject the concept of the "drunken Indian" and do not want to be alcoholics. Although Indian young adults, and even many adults, feel this powerful pressure, the effect it has on adolescent drinking is unknown.

Alcohol use by Indian youth also has an economic impact. For a host of historical reasons, many reservations are severely economically depressed. Whereas non-Indian youth may spend a small percentage of their available income on alcohol, the same amount of money spent by an Indian youth may represent a sizable proportion of available income. An analysis recently completed (Loretto et al. 1986) reveals that Indian youth up to 18 years of age on reservations across the country spend $2.9 million annually for alcohol. Young Indians who drink heavily may each spend more than $100 per year, a very large sum in a depressed economy. Of course, these figures for youth represent only a small part of the overall outlay by Indians for alcohol.

At the tribal level the drain on the economy also can be substantial, particularly when these numbers are projected for the entire adult population. Most of this money flows directly off the reservation and does not recirculate in the local economy. Again, where money is scarce, the effect can be substantial. By way of illustration, in one small town on a reservation where, by tribal law, it has been legal to sell alcohol, the only authorized liquor establishment recently closed. The community was forced to curtail drastically public services such as police protection and street maintenance because tax revenues from the single retail outlet had paid for a large portion of community services. Nearly everyone in this town was aware of the situation and expressed concern. Surprisingly, there was universal awareness that alcohol was a major component of the economic structure of the community.

Finally, research itself may affect how Indian people view alcohol use and abuse. Indians often comment, "We are tired of the parade of people coming here and listing all our awful problems." When the focus is on the negative, Indian people feel singled out as uniquely prone to social problems. This attitude also can be expressed in a slightly different way. After years of work in the area of Indian substance abuse, invariably the first question the authors are asked is, "Why do Indians drink?" Behind this question lie two assumptions. One is that *all* Indians drink inordinately, and the other is that something idiosyncratic is happening outside our understanding of drinking behavior in general. As this report will show, neither assumption is necessarily true. Another explanation is that the context of alcohol use on reservations has many elements that differ from non-Indian society, and that the effect of these elements on how Indian youth view and use alcohol almost certainly influences their drinking patterns.

Alcohol Use Rates

Lifetime Prevalence

The extent of alcohol use in a population can be measured in several ways. The simplest is to ask, "Have you *ever* used alcohol?" This index, known as lifetime prevalence, yields the percentage of respondents who have ever had any type of drinking experience. The lifetime prevalence measure is limited in that it provides no indication of the amount, intensity, or duration of use. For example, it does not distinguish between a youth who had one sip of beer 2 years ago and one who drinks to a state of drunkenness every weekend. Despite these limitations, lifetime prevalence can indicate how widespread the experience with alcohol is, and because this index is included on most surveys, it allows comparisons between populations.

The percent of 7th-12th grade students who have ever used alcohol (i.e., lifetime prevalence) is depicted in figure 1. Indian students are compared with non-Indians (Miller et al. 1983) over a 10-year period. The general trend is for Indians at every point to have a higher lifetime prevalence than their non-Indian counterparts. By the time young people reach the 12th grade, nearly everyone–Indian and non-Indian–has tried alcohol (figure 2). The higher rates for Indian youth that appear in figure 1, therefore, are not due to differences among older adolescents, but rather must occur because of differences in younger people. Although alcohol is less readily available on reservations than in non-Indian communities, younger Indians are more likely to have tried it.

The trends across this decade are interesting. In figure 1 the differences from year to year are rather small but are so consistent with other findings that they are probably meaningful. From the mid-1970s, steady increases occurred in the use of alcohol and many illicit drugs, particularly marijuana. Rates of lifetime prevalence increased until about 1981, at which time marijuana use began to drop slightly and has continued to drop. Does this indicate that young people were shifting from marijuana to alcohol? Johnston and colleagues (1984) found no associated increase in alcohol use. Youth were simply using drugs less; they were not moving from marijuana to alcohol. The same trend in marijuana use occurred among Indian youth, even though marijuana was used at much higher levels, lifetime prevalence for marijuana increased until the early 1980s, then dropped slightly (Beauvais et al. 1985). Did Indian youth substitute alcohol for marijuana? Has its use increased as marijuana use decreased? Even though the changes are small, these data suggest that it has not. Rather, alcohol use is also dropping slightly.

The differences in lifetime prevalence between males and females are shown to have changed as a function of grade level (table 2). Until about the eighth grade, more males than females have had alcohol experience; the gap then narrows. The reason for the difference in the 11th grade is unknown but may relate to factors such as differential dropout or a slightly larger number of females who never will try alcohol. Two things seem important. First, even though fewer females have tried alcohol, they are by no means immune, even at the lower grade levels. Second, something important happens among the females during their junior high school years; whatever factors protected them from alcohol when they were younger are no longer effective.

These results show clearly that alcohol is a common element in the lives of Indian youth. But in order to understand the actual extent and patterns of alcohol use, more detailed questions must be asked. To identify how many youth are using alcohol on an ongoing basis, one question asks the number of occasions alcohol was used within the 2 months preceding the survey.

In 1982, 48 percent of all Indian 7th-12th graders had used some alcohol in the preceding 2 months

Table 2.–Lifetime prevalence of alcohol use by sex and grade among Indian young people, 1984

	Percent ever tried	
Grade	Males	Females
4	23.1	15.2
5	29.4	22.4
6	47.4	38.9
7	67.2	54.5
8	70.4	68.7
9	84.4	82.3
10	90.9	89.5
11	91.8	93.1
12	95.6	91.5

Figure 1. 10-year trend in lifetime prevalence of alcohol use among 7th-12th grade reservation Indian and non-Indian youth

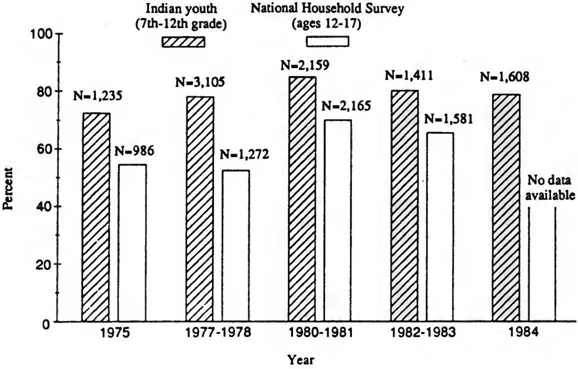


Figure 2. 10-year trend in lifetime prevalence of alcohol use among reservation Indian and non-Indian high school seniors

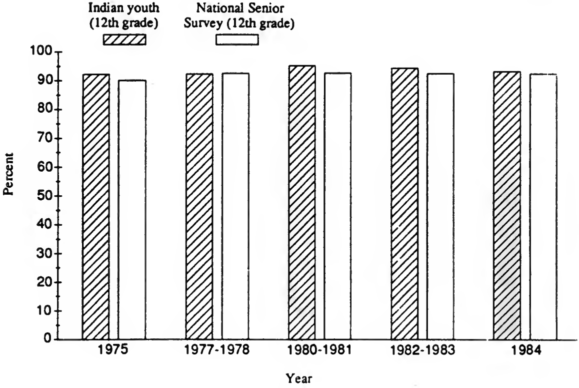


Table 5.–Peer influence and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Peer encouragement	.549	.549	595.12	.000
Peer sanctions	-.391	.591	99.95	.000

[a] For r> .045, p< .05.

Table 6.–Family influence and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Family sanctions	-.248	.248	88.15	.000
Family intactness	-.091	.264	11.70	.000
Family relationships	-.140	.267	2.66	.103

[a] For r> .045, p< .05.

Table 7.–Family intactness and alcohol involvement of Indian youth

	Percent with parents at home[a]			
Degree of alcohol involvement	Neither	Only father	Only mother	Both
First quartile	19.7	20.7	24.3	29.1
Second quartile	28.3	26.8	24.5	27.2
Third quartile	27.6	24.4	24.5	25.4
Fourth quartile	24.4	28.0	26.6	18.4
N	(127)	(82)	(432)	(729)

[a] Total N = 1,370, $\chi^2 = 17.36$, $p < .043$.

Family

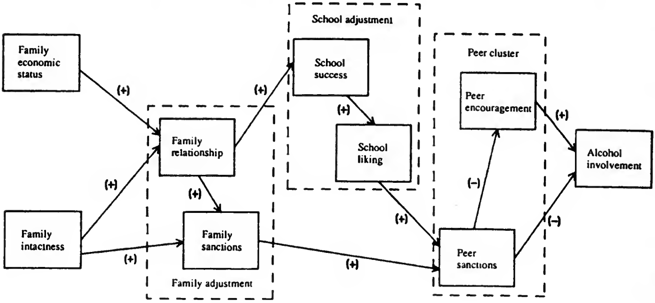
One of the strengths of Indian culture is a strong belief in family, family relationships, and the extended family. The most important function of a family in preventing alcohol involvement is to provide strong sanctions against its use (table 6). When youth believe their families would try to stop them from drinking and getting drunk, they are less likely to get involved in peer clusters that use alcohol heavily.

Table 7 shows further how family intactness relates to alcohol involvement. If both parents are home, the youth has a slightly better chance of not being involved in alcohol and a slightly lower chance of being heavily involved in alcohol. Otherwise, the differences are so small they cannot be interpreted. Youth from either intact or broken families can become alcohol involved. Although data are not available to demonstrate it, this correlation may be relatively weak because, in Indian families, the extended family helps take over the role of the immediate family if the immediate family is not intact.

Strong family relationships, i.e., the general feeling that the family cares, are also related to alcohol use. However, the correlation is relatively weak, and, once the predicted variance associated with strong family sanctions and family intactness is accounted for, it does not make an additional contribution.

Other research, however, suggests that family relationships play a more central role than that depicted here (Oetting and Beauvais, in press). A path analysis

Figure 8. Hypothetical path model for socialization characteristics and alcohol involvement



of the socialization links with drug and alcohol use shows family relationships to be a major factor. The feeling that the family cares underlies strong family sanctions; it is highly related to success in school and through that to the liking of school. These other variables may be more directly related to preventing association with alcohol- and drug-using peer clusters, but family relationships seem to underlie and support them all (see figure 8). Family relationships are critically important in producing an Indian youth able to avoid alcohol involvement.

Family Education/Economic Status

Socioeconomic status of the family usually has some bearing on whether a youth will encounter problems. Three measures are used to assess socioeconomic status. Education is scored as the highest grade reached by either the father or the mother. Economic status is assessed by questions asking whether adult members of the family have "good" jobs and whether they earn "good" money. A third measure assesses the youth's own economic and educational expectancy, i.e., young persons are asked if they expect to graduate from high school, be respected, and earn enough money to buy the things they want.

Although the correlations are low, family economic and education status relate significantly to alcohol involvement; if the family has a better income, the youth is somewhat less likely to get involved with alcohol (table 8). In this sample, the youth's own expectancy for the future is not related to alcohol involvement. This finding is unexpected since other studies have found that youth with poor expectancy are somewhat more likely to become alcohol or drug involved (Oetting et al. 1984).

Table 8.—Family education/economic status and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Family economic status	-.073	.073	6.28	.012
Family education	-.060	.104	6.28	.012
Expectations for the future	-.032	.109	1.19	.276

[a] For r > .045, p < .05.

compared with 27 percent of non-Indian youth in the National Household Survey who had used it in the past month. Nearly 40 percent of 12-year-old Indians had used some alcohol in the previous 2 months, and about 8 percent had used it on multiple occasions (figure 3). By the time they are 17 years of age, three-fourths of these youth have used alcohol recently and about 10 percent report using alcohol 10 or more times in the past 2 months.

Another index of intensity of alcohol use is drinking to the point of drunkenness. The percentages of 8th and 12th graders who report getting drunk in the past month are reported in figure 4. Note that at both grade levels a greater percentage of Indian than non-Indian youth report getting drunk. Although overall rates for the 12th grade are not drastically different, more Indian than non-Indian students report multiple occasions of drunkenness.

Finally, data on the percent of youth who report having "blacked out" while drinking are shown in figure 5. Minor differences exist at the eighth grade level, but important differences between Indian and non-Indian youth appear at the senior level. A greater percentage of Indian youth have blacked out, and most of the difference occurs in the "three or more times" category. It should be noted that "blackout" does not necessarily mean that the youth suffered an alcohol-based physiological trauma leading to loss of memory. For both Indian and Anglo youth, the rates of reported blackout are far too high to connote this.

Among these youth, blackout is far more likely to mean a situation in which it was difficult to track everything that happened or a situation during which things occurred that the youth wanted to deny. Reporting this kind of blackout, however, probably does mean that the youth, on that occasion, drank a great deal. The relative rate of blackout is, at the minimum, an indication of the number of youth who have had at least that many experiences with ingesting large amounts of alcohol.

Age of First Intoxication

The age of first intoxication is another indication of the seriousness of alcohol abuse; the younger an individual is when he or she first gets drunk, the more likely this pattern is to continue. It is also important to know at what ages youth are most vulnerable to heavy drinking. This information can be displayed in an acquisition curve. Figure 6 presents the acquisition curve for 12th graders and is based on a question that asked at what age they first became drunk. The curve is cumulative and the points for each age show how many of these students had experienced drunkenness *prior to that age*. For instance, about 25 percent of both groups reported that they got drunk for the first time prior to age 13. Another 15 percent were first intoxicated between ages 13 and 14.

Several important trends emerge here. First, up to age 11, only a small number had experienced drunkenness. Shortly thereafter, however, the curve turns sharply upward until about age 16. This change may correspond to the point at which peer pressure to get drunk increases greatly. Each year about 15 percent more students experience drunkenness until age 17 or 18, when the curve begins to taper off. By that time approximately 72 percent of non-Indian seniors and 82 percent of Indian seniors had been drunk at least once. If data for those beyond age 18 were available, a few additional students would probably have gotten drunk for the first time, but the curve suggests that a natural ceiling may be reached soon after this age, particularly for non-Indian youth.

The curves for Indian and non-Indian youth are remarkably similar up to age 15. Although more Indians than non-Indians try alcohol before the senior year (see figure 1), Indians and non-Indians experience intoxication for the first time at about the same age. Unfortunately, once they have been drunk, Indian youth tend to get drunk more often (figure 4). The divergence beyond age 15 shows that a greater percentage of Indian youth will eventually get drunk for the first time and that the ceiling has probably not been reached by age 18.

One data complication should be recognized. Data depicted in figure 6 pertain to students attending school. On many reservations dropout rates are very high compared with rates for non-Indian schools. Dropouts also are likely to have greater substance abuse problems (Johnston 1973; Kandel 1978) and are not included in the data presented here. If all dropouts had been included, both curves probably would be somewhat higher. Nevertheless, the curve for Indians probably would be higher than that for non-Indians since Indian youth drop out at a higher rate, and dropping out is generally associated with higher alcohol use.

Additional sex differences in drinking behavior are noted in figure 7. Four curves show acquisition of first intoxication for senior males and females from both the Indian and non-Indian group. In general, more males have been drunk at an early age. The

Figure 3. Amount of recent alcohol use (in last 2 months) by age among reservation 7th-12th grade Indian youth, 1982 (N=2,164)

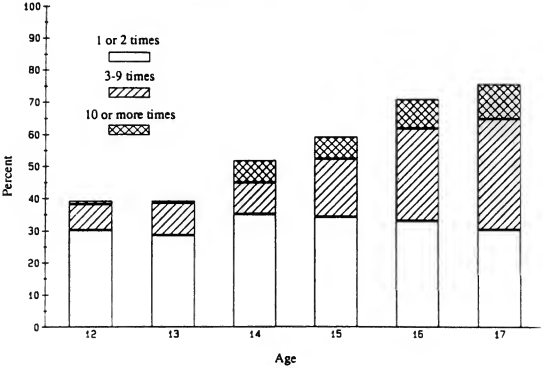


Figure 4. Frequency of drunkenness in past month among Indian and non-Indian youth by grade, 1984

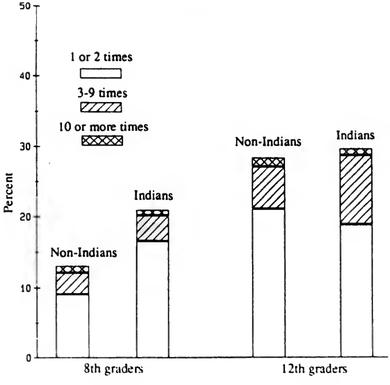
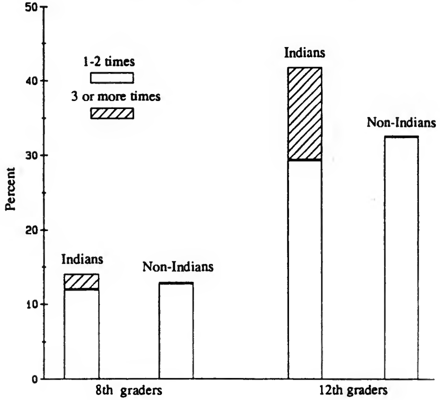


Figure 5. Frequency of blackouts while drinking among Indian and non-Indian youth by grade, 1984



numbers are highest for Indian males, followed by non-Indian males, non-Indian females, and Indian females. At age 12 there is a notable 25 percent difference between Indian males and females. These general relationships hold through the steepest part of the curves, but at the upper end the number of Indian females who have been drunk surpasses both non-Indian groups and converges on the male Indian rates. If the curves were extended, by approximately age 20 an equal number of Indian males and females would be shown to have been intoxicated at least once. This may mean that for Indian females early protective factors against getting drunk erode over time.

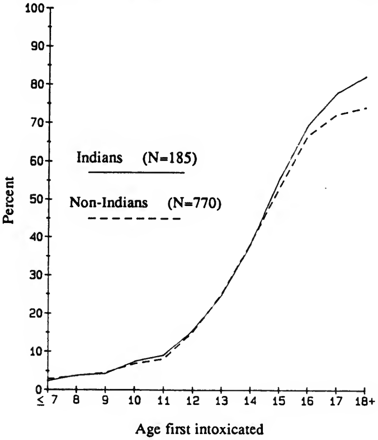
Alcohol and Drugs

Up to 20 years ago, alcohol was the only psychoactive chemical widely available among adolescents. Although small enclaves of youth may have used particular drugs, most adolescents had little access to or knowledge of psychoactive drugs. The picture now has clearly changed. In the past two decades, a wide variety of drugs have become available, and adolescent culture has evolved to include drug use. Marijuana has become expecially popular, in some places rivaling alcohol as the drug of choice for social occasions, particularly among Indian youth (Beauvais et al. 1985).

Indian youth are not immune to changes in adolescent culture. No matter how isolated or remote the tribe, a few young people have obtained and used every drug available in urban settings. In fact, according to our findings, Indian youth have higher use rates for nearly every category of drug. An increase in the use of a particular drug, however, tends to lag a year or so behind use by non-Indian youth. In essence, the only effect of the relative isolation of reservations is to delay the upsurge in use that accompanies the early stages of the spread of drug use. Drug use for Indian youth also relates to the inaccessibility of alcohol. Because many reservations prohibit the sale and some even the possession of alcohol, marijuana is more accessible than alcohol in certain locations. As a result, young people may experiment with marijuana before they are even introduced to alcohol.

Once Indian youth enter adolescence they tend to use alcohol and other drugs in combination (table 3). A scale reflecting involvement with alcohol was con-

Figure 6. Comparison of acquisition curves for Indian seniors and non-Indian seniors from a western community, 1984



structed and the sample of Indian youth divided into quartiles. The trends are nearly linear and in the direction of more drug use as alcohol use increases. Given these strong relationships, it seems imperative that alcohol use be viewed and treated in the context of the use of other drugs and that treatment for other drugs not exclude alcohol. For many youth, drugs and alcohol may have similar meanings; thus, both prevention and treatment would be enhanced by attention to all classes of chemicals.

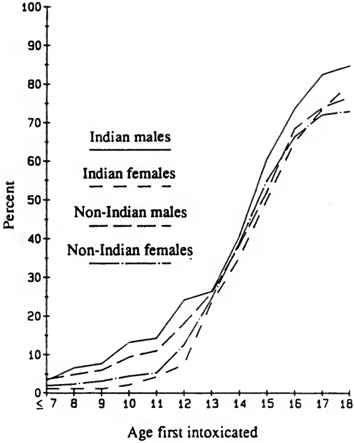
Peer Cluster Theory and Adolescent Alcohol Use

A variety of theories exist about the "causes" of alcohol abuse. In trying to understand alcohol use among *adolescents*, however, a special aspect of the problem arises. The theories that deal with adult alcoholism and the role that alcohol plays in adult lives are only partly relevant to understanding why and how young people use alcohol. Many of the adult theories,

Table 3.—Relationship of alcohol involvement to other drug use among 11th and 12th grade Indian youth, 1982 (N=313)

Amount of alcohol use	Percent having tried			
	Cigarettes	Marijuana	Inhalants	Other drugs
First quartile	6.0	6.0	2.2	0.3
Second quartile	7.0	11.3	3.8	3.5
Third quartile	20.5	29.2	8.5	11.5
Fourth quartile	31.0	39.3	18.8	23.6

Figure 7. Comparison of acquisition for 12th grade male and female Indians and non-Indians from a western community, 1984



for example, focus predominantly on the physiological effects of alcohol, particularly those that lead to alcohol addiction. Evidence suggests some people may inherit characteristics that make them particularly susceptible to the effects of alcohol and lead to a high probability of addiction (Schuckit 1984). Although such a theory may help explain alcoholism for a small group of adults, it is not particularly helpful in understanding adolescent alcohol use. Most young drinkers have not had time to develop this type of addiction, and drinking by youth is only rarely based on the mechanisms of physiological addiction.

The authors' peer cluster theory is designed specifically to explain and predict the alcohol use of adolescents (Oetting and Beauvais 1986). While respecting the physiological potency of alcohol, peer cluster theory postulates a set of psychosocial forces that make some people particularly susceptible to alcohol involvement or that can, conversely, prevent alcohol abuse. Many of these characteristics are social, relating to the youth's environment. For example, poverty, lack of opportunity, and family disorganization can establish a potential for alcohol involvement. On the other hand, a strong family or extended family, potent family sanctions against using alcohol, or in a family that has a meaningful stake in Indian culture may inoculate and protect against alcohol abuse.

Other important characteristics are internal to the individual: personality characteristics, attitudes, and beliefs. Psychological factors such as depression or a belief system that does not see cheating, lying, or stealing as wrong are more likely to lead a youth to alcohol abuse. In contrast, a more self-confident youth or one who wants to be seen as a "good person" is less likely to be heavily involved with alcohol. These social and psychological forces interact to form a substrate that sets the stage either by creating a potential for serious alcohol abuse or by inoculating a youth against alcohol abuse.

Although these psychosocial precursors are important, peer interactions are likely to determine the actual use of alcohol, including how, when, where, and how much a youth drinks. The potential for alcohol abuse is almost always realized through contact with peers. Peers initiate the youth into alcohol abuse, provide alcohol, talk with each other about drinking and model drinking behaviors and, thereby, shape attitudes toward drinking and drinking behaviors. A peer group consensus determines where and when alcohol is to be used, how much is to be drunk, and even how one is to act when drinking or drunk.

Initiation is an important function of the peer cluster. Initiation into use of alcohol has two components: the first time alcohol is used in any form, and the first time alcohol is used to get high or drunk. For many youth, the first initiation is relatively meaningless. In Indian families that use alcohol, first use usually occurs at an early age within the family setting and bears little relationship to the time when alcohol is first used to get high or drunk. Initiation into getting drunk occurs later, most often with peers, and results from involvement in an alcohol-using peer cluster.

Another important function of the peer cluster is to provide access to alcohol. Non-Indian youth often obtain alcohol from home or from other adults; it is readily available in the community. For Indian youth, peers are likely to provide the alcohol directly.

Once initiation into alcohol use within the peer cluster takes place, the use of alcohol has direct and indirect effects on the individual that may increase alcohol involvement. This can occur either through an individual moving to peer clusters that have greater alcohol involvement or through increases in alcohol use within a peer cluster. Younger children, for example, who are already experimenting with alcohol within small peer clusters may gravitate to older alcohol-using peer clusters when they move to junior or senior high school.

In another scenario, a youth may not shift peer clusters but instead may remain within the original cluster. If the cluster begins to experiment with alcohol, the youth involved is likely to find it rewarding. In younger children, alcohol use usually is identified with being "older"; by drinking they can show they are bigger and older. Because using alcohol is frowned on by adults, youngsters also can prove by drinking that they are not controlled by adults. When peers get together to drink, the occasion can be a strongly reinforcing social situation, with music, talking together, and doing exciting things. Even the next day, social rewards are derived from talking about what happened and what they did. Any or all of these effects can lead drinking to become a regular activity of the peer cluster and alcohol to become one reason for the peer cluster to exist.

Eventually, groups of young people form peer clusters that use alcohol together. They drink during particular times and in particular places, and members of the group tend to share the same ideas, values, and beliefs about using alcohol and getting drunk. Alcohol and drugs play an important part in defining the group, shaping its behaviors, and maintaining the group structure. In order to maintain membership in a peer cluster and be respected and liked by the other members, a youth must express these shared attitudes and use alcohol as other members do.

A peer cluster of this kind may be a small "gang" consisting of a few close friends and several others who "hang out" with them. Among younger children, the drug-using peer cluster may even be a small group of siblings or close relatives who are about the same age and live together. A peer cluster also can be a dyad–a pair of "best friends" or a "boyfriend/girlfriend" pair.

"Peer group" and "peer cluster" are different concepts. A peer group includes any formal or informal group with which a youth associates, such as the eighth grade class or a football team. A peer cluster is usually a smaller, cohesive group with whom the youth spends time. A peer cluster does not necessarily have a negative influence; it can reject alcohol use and drunkenness. However, when drinking is part of the cluster's activities, the way a youth drinks becomes part of that youth's membership in the peer cluster. Youth may belong to more than one peer cluster. When this happens, their behavior and even their attitudes change depending on the clusters with which they are currently associating.

The emphasis on peer clusters as initiating and maintaining forces in alcohol abuse by youth does not mean that the effect of alcohol itself can be ignored. Some young people move from drinking within the peer cluster to drinking alone. Alcohol alters consciousness, and that alteration can be perceived as pleasant or as reducing anxiety (or depression, even though alcohol is typically classified as a depressant). A youth may increase use and seek out opportunities to drink alcohol because of these effects.

For other youth, the biochemical effect of alcohol can mesh with an underlying personality problem or lack of development (Spotts and Shontz 1980). When that happens, alcohol may seem to meet deep-seated personal needs. Alcohol use under either of these circumstances is likely to become obsessive, and the youth will use alcohol chronically and when alone.

Inherited physiological conditions (Schuckit 1984) or medical conditions may make some youth particularly susceptible to the effects of alcohol. Here, too, the youth may move from peer-dominated use to drinking alone and may be well on the way to physiological or psychological addiction. Interestingly, when this happens, the youth may be isolated from the peer cluster that originally shaped drinking behaviors, i.e., the youth becomes obsessed with alcohol to the exclusion of old friends and companions.

Peer cluster theory has important implications for alcohol counselors. Focusing only on the drinking youth's attitudes, values, and behaviors is insufficient; equal attention must be paid to the youth's peer clusters. If the youth maintains association with those clusters, there is great pressure also to maintain attitudes, beliefs, and drinking behaviors consistent with those of the other members. The counselor will find a great resistance to change. When treatment occurs separately from the youth's environment, it may appear successful until the youth returns to that environment, at which time the peer cluster may undercut the gains that have been made. To prevent this outcome, alcohol counselors must free the youth from peer clusters that encouraged the original alcohol involvement, find ways to make the youth resistant to peer cluster pressures, or develop and strengthen ties to new peer clusters that discourage drinking.

When treatment focuses on the family, the same kind of "sabotage" may occur. Although changes may take place within the family that alter some of the underlying motivations for alcohol use, the youth involved is nonetheless likely to have strong needs to maintain associations with peer clusters, even to the extent of doing so secretly. The peer cluster will almost always try to hold the youth to its own values and drinking behaviors.

The use of alcohol by adolescents is so closely tied to peer cluster involvement, in fact, that when an alcohol counselor finds an adolescent who uses alcohol outside of the peer cluster, it almost always signifies a very serious problem. That youth is likely to be physiologically or psychologically addicted to alcohol or to have serious personality or development problems.

Psychosocial Characteristics and Alcohol Use of Indian Youth

While postulating that peer clusters shape and maintain actual drinking behaviors, peer cluster theory also focuses on important underlying factors that determine whether a youth is likely to get involved with a peer cluster that abuses alcohol. These psychosocial characteristics set the stage for alcohol abuse. Psychosocial variables that we believe are important for understanding alcohol abuse are listed in table 4.

This list includes those variables that we have been able reliably to assess in Indian and non-Indian youth. Several other variables that might have been included, such as internal-external locus of control, are missing because, although they seem theoretically important, the scales used to assess them were not reliable in samples of young Indians. Still others, such as self-esteem, are represented on this list but indirectly. For example, the authors believe that two different components of self-esteem should be measured separately in young Indians. Therefore, the list includes one short scale that asseses self-confidence and another that measures feelings of being socially accepted by others.

Many of the characteristics listed do correlate with alcohol use by Indian youth. However, others that do not relate directly to alcohol use are included because they may eventually serve as mediating characteristics or because they might be assumed to relate to alcohol use when, in fact, they do not. The statistical significance of psychosocial factors associated with adolescent alcohol use is assessed here through the technique of multiple regression.

The Sample

The sample used for these analyses consists of 2,164 7th to 12th grade Indian youth surveyed in 1982. Fifty-two percent were male and 48 percent were female. The sample was drawn from two widely separated large tribes. Since the survey was administered in school, the sample consists only of those youth attending school. The survey was carefully administered so that there were no obvious selection factors. Nevertheless, the percentage of youth in the sample with high alcohol involvement may be somewhat low since there is a high probability that such youth would be school dropouts or absentees.

The criterion for alcohol involvement for these studies is a six-item scale. In the sample used for these analyses, the scale has a Cronbach reliability of .90. The short scales have reliabilities ranging from .77 to .91 and have been tested in many other samples. While there are no reliability estimates for single items, they have been tested in several different samples and tend to maintain the same relationships with other variables

Table 4.–Psychosocial characteristics associated with adolescent alcohol use

- Social structure
  - Age
  - Sex
  - Ethnic group
  - Religion
  - Socioeconomic status
  - Family structure

- Socialization links
  - Religious identification
  - Cultural identification
  - Family relationships
  - Family sanctions against alcohol
  - School success
  - Liking for school
  - Peer sanctions against alcohol
  - Peer encouragement to use alcohol

- Psychological characteristics
  - Self-confidence
  - Feelings of social acceptance
  - Shyness
  - Social isolation
  - Unhappiness
  - Anxiety
  - Feeling "blamed"

- Attitudes/beliefs
  - Tolerance of deviance
  - Importance of being "good person"
  - Expectations for the future
  - Belief in alcohol dangers

- Rationales
  - Use at parties
  - Use with friends
  - Like the feeling
  - Excitement
  - Sex
  - To be free
  - To get back at parents
  - Feeling angry
  - Reducing anxiety
  - Feeling unhappy
  - Feeling lonely
  - Reducing social anxiety
  - Feeling bored

- Behaviors
  - Alcohol use
  - Deviant behaviors
  - Peer contexts

across these samples, thus arguing for reasonable reliability.

Peers

Two factors are included in peer influence: (1) peer encouragement to use alcohol (how many of a youth's peers use alcohol and how much they press that youth to use it), and (2) peer sanctions against alcohol use (whether friends would try to stop a youth from drinking and whether they would try to prevent getting drunk). The two characteristics, although related, are quite different. For example, a youth can be involved with peers who use alcohol and can be under considerable pressure to drink, yet other friends would go out of their way to stop him or her from drinking. The correlations between peer influence and alcohol involvement in Indian youth are shown in table 5. These correlations are substantial and are the strongest relationships found between characteristics of Indian youth and their use of alcohol. They combine to be even more predictive than they are individually. Taken together, the two correlate .59 with alcohol involvement.

These data tend to confirm the critical importance of peer influence and, to that extent, tend to confirm peer cluster theory. It must be noted, however, that peer cluster theory involves a great many other hypotheses about peer clusters that go far beyond this particular finding and that, as yet, are not confirmed. For example, peer cluster theory suggests that youth within a cluster gradually develop very similar attitudes, values, and beliefs about how, when, and where alcohol should be used. Another hypothesis is that members of specific peer clusters use alcohol similarly and under the same circumstances. As yet, no available data address these issues. Although the above results do not absolutely confirm peer cluster theory, they are consistent with it. Peers do indeed play a central role in alcohol use of Indian adolescents.

Table 9.—Social adjustment and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Likes school	-.225	.225	93.90	.000
School success	-.184	.285	23.48	.000

[a]For r > .045, p < .05.

The low socioeconomic status of reservation youth poses a problem for analysis. Nearly all of the group would be classified as disadvantaged if they were included in a larger study of all American youth. For years, Indian youth have had a high school dropout rate, and many of their parents have not completed high school. In addition, the unemployment rate on reservations can be as high as 80 percent.

School Adjustment

School adjustment includes two important elements. The first, the relationship between success in school and alcohol or drug use, has been widely researched. Typically, youth who are drug and alcohol involved are likely to have poorer grades. There is, however, a second element to adjustment: if a youth is going to stay in school (and do well), the school must provide a reinforcing environment, i.e., the youth must like school.

Both success in school and liking school are related to alcohol involvement; the student with poor school adjustment is more likely to be involved with alcohol (table 9). Liking or not liking school is probably more closely related to adjustment than is success in school, although both factors contribute to increasing the chances that a young Indian will be alcohol involved.

It is necessary to discuss the role of causation in peer cluster theory. One could ask, "Does poor school adjustment cause a youth to identify with groups that use alcohol, or does alcohol use lead to poor school adjustment?" In peer cluster theory, there is no simple answer about causation. The youth who does poorly in school, finds it punishing, and does not like school may find it easy to join with other youth who feel the same way. This group is likely to share other characteristics: relative hostility to authority, rebelliousness, and, since school is offering them few rewards, a tendency to seek reinforcement outside of school. One way of acting out and of seeking "pleasure" is to drink. The potential for alcohol use is mobilized through membership in this peer cluster. Once mobilized, alcohol use itself can become a causative agent. Alcohol causes changes in moods and feelings that can make the youth think that he or she feels better. Moreover, alcohol use often is associated with being with friends, having fun, and being happy. These feelings and associations can increase the probability of further use. Time may be spent drinking with the "gang" instead of studying or reading. In extreme cases, young people may be "hung over" or even drunk during school hours. More subtle effects also exist. Young people in a peer cluster must express, in general, the same basic attitudes and beliefs as others in the cluster. Sharing negative feelings about school makes those attitudes firmer and more resistant to change. Thus, involvement in an alcohol-using peer cluster can work to make school adjustment even more difficult.

The dislike of school that builds up in these youth can then isolate them from others, both friends and teachers, who could potentially encourage school success and discourage alcohol involvement. It is important to see the strong circularity in causation. The earlier event may have been poor school adjustment. An even earlier third factor may have caused both school problems and alcohol use. But whatever the initial event, a series of reciprocal effects is likely to occur. A social or personal condition stimulates identification with peer clusters that use alcohol; alcohol use leads to closer identification with those groups and, perhaps, to expanded alcohol use. That, in turn, reflects on the personal condition or social adjustment, making it worse, and so on. Adolescent drinking is not an isolated laboratory phenomenon in which causes and effects can be readily separated. Rather, it is a complex, interactive system with no ready distinction between cause and effect.

Psychological Characteristics

The correlations between psychological characteristics of Indian youth and alcohol use are quite low (table 10), not an unexpected finding. Typical results

Table 10.–Psychological characteristics and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Unhappy	.104	.105	14.79	.000
Feelings of social acceptance	-.058	.116	3.37	.067
Social isolation	.019	.127	3.71	.054
Anxiety	.096	.140	4.59	.032
Shyness	.017	.142	.74	.391
Self-confidence	-.058	.143	.54	.463
Feeling "blamed"	.042	.143	.00	.968

[a]For $r > .045$, $p < .05$.

from other studies show only low correlations between adolescent alcohol and drug use and personality measures (Gersick et al. 1981). One hypothesis is that alcohol is used by some youth as a "self-medication" to relieve their psychological problems. Another personality hypothesis is that alcohol use is related to problems of low self-esteem. Both may be true to some extent. Small positive correlations exist between alcohol use and anxiety or unhappiness (depression is too strong a word for the level of unhappiness characterized by this scale). Very small negative correlations exist between being self-confident and using alcohol. The strength of the correlations, however, suggests that none of these personality characteristics are major reasons for alcohol use among Indian youth.

Many researchers believe that one should be able to establish strong relationships between personality and alcohol abuse. However, we believe that the correlations shown here reasonably represent the actual relationships between personality and adolescent alcohol abuse–significant, but accounting for only a small part of the variance in alcohol use. The scales developed here, although short, have high content validity. They also are highly reliable, show good discriminant validity, and correlate with each other and with other variables in expected ways. Most important, these reliability and validity findings are based on large samples of Indian youth, and the results are likely to hold true in future studies.

Deviance

Jessor and colleagues (1980) believe that one of the more important variables in understanding the behavior of adolescents is "problem-proneness." Problem-prone youth have many negative psychosocial characteristics, including deviant behavior and tolerance of deviance. Deviant behaviors are actions perceived as "bad" by the society in which the adolescent lives. Youth with a high tolerance for deviance may or may not engage in these behaviors but do not believe that the behaviors are necessarily "wrong." The deviant behaviors used here as markers for these scales–lying, stealing, cheating, and "doing bad things"–would be viewed as wrong in both non-Indian and Indian cultures. Opposing these behaviors and attitudes would be a feeling, on the part of young people, that they would like to be perceived as "good persons" by their friends, family, and teachers. This feeling can serve as a positive link to social norms and may help protect against alcohol use.

Table 11.–Deviance and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Deviance	.231	.231	76.16	.000
Good person	-.155	.259	19.46	.000
Tolerance for deviance	.150	.264	3.71	.054

[a]For $r > .045$, $p < .05$.

All three variables are related to alcohol use, as noted in table 11. The highest correlation is with deviant behaviors. Indian youth who exibit a greater number of deviant behaviors are more likely to be alcohol involved. Wanting to be seen as a "good person" serves as a counter to alcohol involvement and adds significantly to the prediction. Tolerance for deviance also is related to alcohol use, although it adds minimally to the prediction equation after partialing out the other two variables.

Although the relationships are modest, these results suggest that alcohol use is linked at least in part to general conflict with social norms. The social norm on Indian reservations is strongly against alcohol, despite heavy alcohol use and high rates of alcoholism. Youth who reject other social norms are likely to reject this social norm as well and thus are likely to use alcohol. But these relationships are relatively weak, and only a small proportion of Indian youth reject general social norms to this extent. It is clear that general deviance is not by any means the single major factor underlying alcohol use by Indian youth; a wide range of other causes are equally or more important.

Culture

Because there are so many ways to approach the idea of culture, it is one of the most difficult concepts to examine when attempting to understand the behavior of Indian people. One approach, for example, is to examine historical roles and tribal characteristics. In earlier studies, we worked with a cultural anthropologist to try to identify specific historical characteristics of Indian tribes and relate these characteristics to the use of alcohol and drugs (Levy and Kunitz 1974). The results were intriguing, but connections were usually specific to individual tribes and could be only tenuously connected to the use of alcohol by youth in those tribes.

Another approach is to focus on individuals instead of tribes. Considerable attention has been paid to the idea of acculturation, i.e., the extent to which an individual is adapted to or identified with the majority culture. In most of the literature, acculturation is treated as a unidimensional concept, i.e., an individual is "more" or "less" acculturated. When acculturation is examined in Indian populations, however, many different definitions emerge. For example, in one study acculturation was defined by "blood," or the proportion of ancestry from the specific tribe. In another study, the emphasis was placed on whether the family spoke the tribal language. In still another study, acculturation was assumed to be related to how far people lived from the nearest city.

In this study the authors found that acculturation was not a unidimensional concept that allows for classification of persons on a continuum from Indian to non-Indian identity. Some people identify primarily with Indian culture or with non-Indian culture, but some Indians only weakly identify with either culture, and some strongly identify with both.

Concern with cultural identification also functions with age; older people are most concerned about retaining Indian values. In addition, significant changes have occurred in Indian identity during the last two decades. There is now greater acceptance of being Indian, and many people who would not identify themselves as Indian a few years ago are willing to do so now. Nearly 67,000 people who called themselves white in 1960 changed their designation to Indian in 1970 (Peterson 1985), and this trend is probably continuing. Although there is no direct evidence of the reasons underlying this change, it probably has been rooted in four factors: (1) increased benefits from being included as an Indian on tribal roles, (2) the benefits of being identified as a minority in seeking employment, (3) somewhat lessened prejudice against Indians in society, and (4) a resurgence of Indian identity and pride.

The authors have identified and analyzed six different dimensions of Indian/non-Indian cultural identification that could be measured reliably in young Indians regardless of tribal affiliation. The results are shown in table 12. The first four characteristics in table 12 measure identification with Indian culture and the last two with non-Indian culture. The first four measures correlate with each other significantly and relatively highly. The two measures of identification with non-Indian culture also are highly intercorrelated, but have only a small negative correlation (-.11) with the measures of Indian cultural identification. Although each dimension of Indian cultural identification relates to alcohol involvement, the most important variable appears to be whether a youth has a stake in Indian culture. The two items that assess this dimension ask, "Do you live in the Indian Way?" and "Do you think that you will be a success in the Indian Way?" The sum of these two items is negatively correlated with drug use, and once this correlation is accounted for, the other characteristics contribute very little additional predicted variance.

It is important to recognize that identification with the Indian Way is *negatively* related to alcohol involve-

Table 12.–Cultural identification and alcohol involvement of Indian youth

Variable	Simple r[a]	Multiple R	F to enter	Significance
Personal stake in Indian culture	-.138	.138	25.90	.000
Indian language	-.112	.143	2.08	.149
Family stake in Indian culture	-.102	.145	.55	.459
Indian activities	-.115	.146	.66	.418
Family stake in non-Indian culture	-.001	.147	.22	.641
Personal stake in non-Indian culture	.014	.148	.39	.531

[a] For $r > .045$, $p < .05$.

ment. The idea has been presented that Indians might identify with the stereotyped concept of the drunken Indian and that identification with Indian culture might support use of alcohol. Although these negative relationships are small, they suggest that the opposite is true for Indian youth.

Attitudes relating Indian identity and drinking may be somewhat unclear within the individual. Young Indians express ideas that suggest that they should drink in order to be seen as Indian by their friends. Levy and Kunitz (1974) also have identified an Indian style of drinking that involves heavy and prolonged intake of alcohol until drunk. On the other hand, the young Indians interviewed here make it very clear that they do not identify with people who are addicted to alcohol. Even youth who were using alcohol often made statements such as "I'm not like those drunks!" While the data presented here do not resolve the issue, the results at least contradict the idea that Indian youth see drinking and being Indian as highly associated.

Identification with non-Indian culture is not related either positively or negatively to alcohol use. This conclusion was drawn from responses to such questions as "Is your family a success in the White American Way?" and "Do you expect to be a success in the White American Way?" Although these items do not predict alcohol use, it is important to note that having a high stake in non-Indian culture does not protect against alcohol involvement either.

Reasons for Alcohol Use

According to peer cluster theory, the members of a peer cluster are hypothesized to share their ideas and beliefs about alcohol and to develop very similar reasons for its use. These reasons, then, become both the stimuli and the excuses for using alcohol. As yet, the authors cannot show how the structure of these reasons fits with the formation of peer clusters. The frequencies of different reasons, however, can shed some light on how young Indians think about alcohol use.

Table 13.–Percent of Indian youth endorsing different reasons for alcohol use

Reason	Percent
I like the feeling I get.	36.9
It just makes me feel good.	35.0
To get rid of unhappy feelings.	33.6
It's part of being at a party.	33.0
Makes parties more fun.	32.9
Just to do it with friends.	31.1
I like the way it feels.	30.6
Nothing else to do around here.	29.6
To be with other kids.	25.5
Because other kids do it.	24.0
Helps me get rid of my worries.	23.5
Helps me feel less sad.	23.0
Helps me to talk to other people.	22.5
Helps me get along with others.	21.5
Because I'm bored.	21.3
Helps me relax at a party.	20.6
Makes me less nervous.	20.3
Calms me down when I'm uptight.	20.0
Stops me from feeling low.	15.9
Lets me be wild.	11.2
To show they can't control my life.	10.5
For sex.	10.4
Because I don't care what happens to me.	9.1
To be tough.	8.9
To fight.	7.8
Never use it.	41.4

Table 13 displays the reasons Indian youth gave for using alcohol and the percentage who provided these reasons. Several items indicate that at least a third of Indian youth perceive alcohol as making them feel good. This perception suggests a strong intrinsic motivation for using alcohol. Over 30 percent of Indian youth stated that alcohol is "part of being at a party," and nearly 30 percent stated that they use alcohol because "there is nothing else to do around here." These responses provide some immediate insight into why many Indian youth drink. The reservation environment offers limited recreational resources, particularly for youth. Drinking is something to do, and it is pleasurable. Given those beliefs, it is not surprising that many Indian youth drink.

Over 30 percent of Indian young people stated that alcohol is used "to get rid of unhappy feelings." Almost a quarter stated that it "helps me get rid of my worries" and "helps me feel less sad." One in five Indian youth said that alcohol "helps me relax at a party" and "makes me less nervous." These responses have potentially serious implications because some clinicians believe that the person who takes alcohol for relief of emotional symptoms is much more likely to progress to alcoholism than one who uses it predominantly for social reasons.

In dealing with reasons for drug use, it is crucial to distinguish between a rationale and a psychological characteristic. For example, being unhappy or anxious and using alcohol are only weakly related (table 10). In contrast, a large number of youth say that they use alcohol to relieve feelings of depression and/or anxiety (table 13). At first, the two responses may appear contradictory, but they actually are very different. The chronically anxious person may not be much more likely to use alcohol than one who is not. On the other hand, a youth who is *not* chronically anxious but who sometimes experiences anxiety, as we all do, may very well use alcohol to relieve that anxiety. One in four Indian youth uses alcohol in this way. Such youth are using alcohol as a coping strategy, a practice that may impede the normal developmental process of learning how to deal with feelings.

Low on the list of reasons for using alcohol are those related to anger, rebelliousness, and acting out. Even these reasons, however, are endorsed by nearly 10 percent of Indian youth. Peer cluster theory indicates that youth who present these reasons have a high probability of being members of the same peer clusters, support each other in these beliefs, and use alcohol together in association with these beliefs. If so, this is a group at very high risk. Individual impulse control is already likely to be weak in youth who list anger and rebelliousness as reasons for drinking. Impulse control would be even further weakened by group interactions that involve a tendency to stimulate each other and reinforce "wild" behaviors. Alcohol exacerbates this weakened impulse control, first because alcohol is likely to reduce self-control and interfere with judgment, and second because youth with these feelings often use alcohol (and other drugs) in large amounts to help them do "crazy" things (Walters 1980). This group, therefore, has a high probability of having problems with the law, driving while intoxicated, getting into accidents, and engaging in other dangerous and debilitating behaviors.

Multiple Correlation of Psychosocial Variables and Alcohol Use

All the variables discussed in the above sections were entered into a multiple correlation with alcohol involvement. The first seven variables in order of their contribution to the equation are listed in table 14. No other variables contribute significant additional variance. Simple correlations in table 14 differ slightly from those in other tables because these data are based on only those subjects for whom complete data were available on all variables.

The first two variables in the multiple correlation equation–peer encouragement to use alcohol and peer sanctions against alcohol use–together predict 36 percent of the variance associated with alcohol involvement. Of the long list of psychosocial characteristics, peer influence is the most important by far.

While other characteristics add significantly to the prediction, the total variance predicted by the seven significant factors is only 41 percent, suggesting that other factors not assessed by our current measures may be important in determining alcohol involvement of Indian youth. Nevertheless, 41 percent is a large part of the variance associated with alcohol involvement and demonstrates clearly that psychosocial characteristics are critical factors in determining alcohol use among Indian youth.

The value of the other psychosocial characteristics should not be overlooked simply because the equation is dominated by peer influence. According to peer cluster theory, most of these other characteristics set the stage for alcohol involvement, and many of them occur earlier than alcohol involvement and make youth susceptible to that involvement. A path analysis might show that, once peer influence is accounted for, other variables contribute only indirectly to the prediction. This would be entirely consistent with peer cluster theory. The information depicted in table 14 shows a trend in that direction but also shows that several other characteristics can still have a minor direct effect in addition to their effect through peer influence.

Hypothetical Path Models

The following diagrams are hypothetical path models showing how the authors believe the variables discussed interact to predict alcohol involvement. Although preliminary path analyses generally agree with the relationships in the data, the authors at this time have not done complete path analyses nor tested these models against either the null hypothesis or other models. Therefore, path coefficients are not included at this time.

Socialization characteristics. These are the links between a youth and the major socialization forces in his or her environment: peers, school, and the family. (Religion and community are other socialization links, but too little is known about their interactions to incorporate them in a path model at this time.) The model presented earlier in figure 8 shows how we believe socialization characteristics interact to relate to alcohol involvement. Note that peer cluster theory places peer sanctions against alcohol and peer encouragement to use alcohol proximal to alcohol involvement and that all other socialization characteristics operate indirectly through their influence on these variables.

Both family and school help to create the potential for involvement or noninvolvement with these alcohol-using peer clusters. Family relationships are highly important. The model suggests that they lead, through imposition of family sanctions, to identification with peers who also have high sanctions against alcohol involvement. But family relationships also underlie, to a considerable extent, a good school adjustment, and that too is likely to lead to associations with youths who have high sanctions against alcohol use.

Family economic status and family intactness are only indirectly related to potential alcohol use through their influence on the ability of the family to provide sound family relationships and strong family sanctions against alcohol use.

Self-esteem. Two measures relate to self-esteem: social acceptance and self-confidence. These are highly intercorrelated, and the path model shows how we believe they are connected to alcohol use (figure 9).

Since many people believe that youths with low self-esteem use alcohol because it makes them feel better, it is important to note that this model suggests a much less direct route from low self-esteem to alcohol use. Among Indian youth, self-esteem is highly related to school adjustment. (Although it is believed that the relationships among variables are usually reciprocal, the models show a dominant directionality that leads the authors to believe that school success to a considerable extent determines self-esteem.)

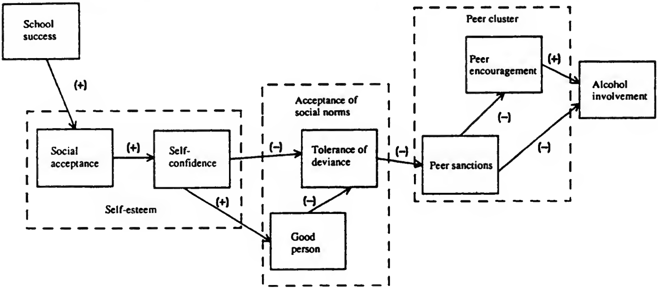
Self-confidence, in turn, seems to be linked rather strongly to accepting social norms, to wanting to be a good person, and to having a low tolerance for deviance. This relationship warrants considerable attention, particularly since a high tolerance of deviance—

Table 14.—Variables that contribute to the multiple correlation between youth psychosocial characteristics and Indian adolescent alcohol involvement

Variable	Simple r[a]	Multiple R	F to enter	Significance
Peer encouragement	.544	.544	481.39	.000
Peer sanctions	-.430	.597	106.85	.000
Deviant behavior	.240	.614	37.60	.000
Family sanctions	-.230	.626	27.68	.000
Likes school	-.276	.635	21.44	.000
School success	-.202	.639	11.45	.001
Social isolation	.024	.642	6.39	.010

[a] For $r > .045$, $p < .05$.

Figure 9. Hypothetical path model relating self-esteem to alcohol involvement



feeling that it is not very wrong to lie, steal, or cheat–is strongly linked to identifying with youth who would not try to stop one from using alcohol.

This route was developed through "theory trimming," so it is not presented here with great confidence. It does, however, suggest the possibility that studies of self-esteem and alcohol use should consider alternative theories–that self-esteem may have some complicated indirect effects and can only really be understood in light of those effects.

Personal/emotional problems. The authors also see indirect rather than direct links between personal/emotional problems and alcohol involvement. However, the paths are somewhat different from those for self-esteem. Where poor self-esteem seems to link eventually to selection of peers who have weak sanctions against using alcohol, emotional problems seem ultimately to link to selection of peers who engage in a high level of deviant behaviors. Although these aspects of peer clusters are highly correlated, they are not quite the same. A peer cluster with a high level of deviant behavior is, indeed, likely to provide weak sanctions against alcohol use, but another peer cluster can have weak sanctions against alcohol but not possess a particularly high level of deviant behavior. A path model shows how personal/emotional problems might link to alcohol use (figure 10).

Feelings of social alienation seem central among the various emotional problems a youth can experience. When a youth feels shy, blamed, anxious, or unhappy or does not feel socially accepted by other youth, that youth may also feel socially alienated. This, is turn, greatly increases the probability that the youth will be involved in deviant behavior and will associate with youth who encourage alcohol use.

This model is in direct contrast to most models that place personality characteristics immediately proximal to alcohol use. Those models assume that alcohol *directly* assuages the negative effect that results from personality problems. The authors believe that the model presented here is probably more accurate–that personal problems work indirectly to increase alcohol use. Personal problems increase the probability that a youth will try to meet personal needs through associating with other youth who are engaged in and encourage deviant behaviors, including alcohol use.

Cultural identification. As noted, cultural identification has a number of different dimensions. The model in figure 11 shows how these aspects of cultural identification are believed to relate to alcohol involvement. The path model shows that speaking an Indian language plays an important role in setting the stage for cultural identification, but it is only the first step. It increases the chances that a family will be involved in Indian activities, and a combination of involvement in Indian affairs and speaking an Indian language links to the family's stake in Indian culture.

"Stake" is an important concept (Ferguson 1976). A family can speak an Indian language and even be of

Figure 10. Hypothetical path model linking personal/emotional problems to alcohol use

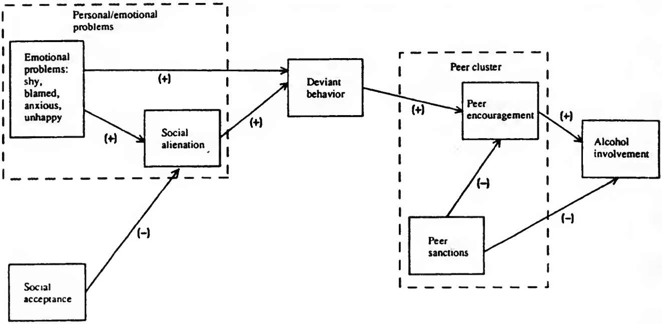
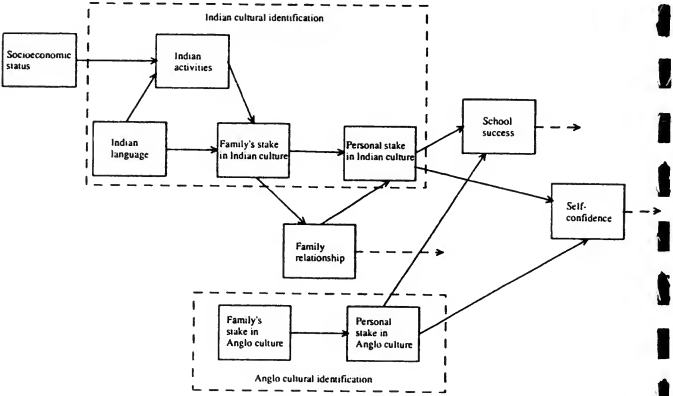


Figure 11. Hypothetical path model linking cultural identification to alcohol involvement


Indian cultural identification
Socioeconomic status
Indian activities
Indian language
Family's stake in Indian culture
Personal stake in Indian culture
School success
Self-confidence
Family relationship
Family's stake in Anglo culture
Personal stake in Anglo culture
Anglo cultural identification

full blood but not have much stake in Indian culture. Some Indian families play little or no role in the affairs of the tribe. These families may appear traditional, live in isolated areas, and have little to do with Anglo culture, but still have little *stake* in Indian culture. Indian culture provides few rewards or benefits for these families, and often they care little about Indian culture.

In contrast, another family might appear highly involved in Anglo culture. The family members might speak English much of the time, have jobs off the reservation, and even have several members with college degrees from Anglo institutions. They could, nevertheless, have a high stake in Indian culture. The family could have grandparents or parents who are medicine men, healers, clan chiefs, and so on. Family members could participate heavily in tribal ceremonies and be highly respected in the Indian community. They would receive many rewards and benefits from Indian culture; they are *successful* in Indian culture and usually care a great deal about it.

There are, of course, very isolated and traditional families with a high stake in Indian culture and other families that are highly involved in Anglo culture and have a low stake in Indian culture. These illustrations are used to show how studies that use blood, language, or isolation as the sole markers for identification with Indian culture can go badly awry.

The model shows that a family's stake in Indian culture is related to family relationships in a positive way. It is interesting that stake in Anglo culture is not related to improved family relationships. Among the reservation youth studied, a high stake in Anglo culture may be a mixed blessing. Adults in the family may leave the reservation to be involved in the jobs and Anglo activities that give them a stake in Anglo culture and, therefore, may be less available to the children.

Cultural identification clearly has its roots in the family. An individual youth's stake in Indian culture is very highly related to the family's stake in Indian culture. The youth's stake in Anglo culture is also very highly related to whether the family has a high stake in Anglo culture. Stake in Anglo culture and stake in Indian culture are slightly negatively correlated ($r = -.11$). But both are positively related to increased school success and to higher self-confidence. A strong element of success is included in stake in a culture. This probably explains why stake in either culture relates to improved performance in school and better self-confidence.

Weibel-Orlando (1985) showed that full-blooded Indians are somewhat more likely to be involved heavily with alcohol. On the surface, this finding may seem to contradict the findings presented here. However, Weibel-Orlando's study was conducted in an urban area, and it very well may be that alcoholic Indians in big cities left the reservation in part because they did not have a high stake in Indian culture. If they had had a high stake in Indian culture, they might have stayed on the reservation, played an important role in Indian affairs, and avoided alcoholism. Bernard Segal (personal communication, 1985) observed that when Native Alaskans who have been classified as alcoholics take over important tribal roles, they may stop their heavy drinking.

Four important aspects of this model should be emphasized. First, cultural identification is not a simple matter of acculturation versus nonacculturation or acculturation stress, but instead includes several different and linked dimensions. Second, identification with Indian culture and identification with Anglo culture are not at opposite ends of a continuum. They are relatively independent of each other, and, in fact, the youth with a high stake in both cultures–the bicultural youth–may be in the best position to avoid heavy alcohol involvement. Third, identification with Indian culture generally is a *positive* rather than a negative force; it is related to improved family relationships, better school success, and increased self-confidence. Fourth, while cultural identification is important in the adjustment of Indian youth, including their susceptibility to alcohol abuse, it is an underlying characteristic, and its effects are indirect. It is the influence of cultural identification on other characteristics that is important; few or no *direct* links extend from cultural identification to alcohol involvement.

Implications and Conclusions

What are the implications of these results for the prevention of alcohol abuse by Indian youth? Indian youth do use alcohol more heavily than non-Indian youth. Both groups first get drunk at about the same age, but, once they start drinking, Indian youth get drunk more often and, judging from the number who have experienced blacking out, may consume more alcohol when they do get drunk. These patterns are not an isolated or time-localized phenomenon but are relatively consistent over a 10-year period.

Why do they drink so heavily? There may be a long-term tradition of heavy drinking because alcohol has been illegal or controlled for such a long period–a tradition of drinking "Indian style," using up immediately whatever alcohol is available. There are, however, other reasons. Few recreational or other activity resources are available on the reservation, and many young people drink because they are bored or have nothing else to do. In addition, alcohol is a psychoactive substance, and youth report that they like being high and feeling good. About 25 percent of Indian youth may drink occasionally because they believe that alcohol assuages feelings of depression and/or anxiety, and 10 percent may drink because of anger, rebelliousness, and hostility. These latter reasons are particularly serious because they can lead to a recycling that exacerbates the basic problems; that is, alcohol temporarily makes the youth feel better, but can then cause more depression or create conflict with authorities and family that increases anger and hostility and ultimately leads to further alcohol use.

Like other youth, Indians also drink to be with their friends. This is a particularly important key to alcohol use by youth. Peer cluster theory hypothesizes that nearly all adolescent drinking is done within the structure of peer clusters and that peer clusters provide alcohol, initiate getting drunk, and determine and maintain attitudes and beliefs about drinking and drinking behaviors.

An alcohol-abusing peer cluster, however, does not appear suddenly and mysteriously to lure a youth into drinking. Contrary to the popular perception of peer pressure, which implies that the youth is a passive recipient and that peers push the youth into using alcohol and drugs, the authors maintain that a peer cluster includes the youth and that the youth plays as active a part as other members in encouraging alcohol or drug use. Most youth in an alcohol-abusing peer cluster joined that cluster because they either felt ready to be involved with alcohol or because they shared an underlying susceptibility to alcohol abuse with other members.

How do youth become susceptible to alcohol? A wide range of psychosocial factors create the potential for alcohol abuse. Each of these factors represents a problem of one sort or another. The youth with few or no problems obviously is likely to try alcohol but is less likely to become involved with peer clusters that use alcohol heavily. The youth with problems is far more likely to associate with other troubled youth and join with them to form groups that evolve into alcohol-abusing peer clusters.

Peer cluster theory has important implications for prevention programs. For example, one type of program focuses on creating individual resistance to peer pressure. Such a program may increase the chances that young people who are not alcohol oriented will encourage each other, within their peer clusters, to continue avoidance. This may be the reason why such programs run by youth are effective but the same programs run by adults are not. The youth-based program may work to form attitudes within peer clusters that help those clusters that are already somewhat resistant to alcohol or drug abuse maintain that resistance. Programs run by teachers or other adults may unintentionally focus only on the individual and not tap into the peer cluster structure. In any case, programs that try to increase individual resistance are not likely to help the youth who is already involved in an alcohol-abusing peer cluster or in one that is moving in that direction. That youth is not passively resisting but is part of the encouragement that the peer cluster supports and enhances. In such a situation, a program that tries to change individual attitudes is likely to have minimal effect.

Another form of prevention focuses on the family. Data presented here suggest that the family can be an important influence. However, it is important to recognize that family influence is not direct. When young people feel that their families provide strong sanctions against alcohol use, they are more likely to associate with peer clusters that also have strong sanctions against alcohol abuse. Those peer clusters, in turn, can provide a structure for avoiding heavy alcohol involvement.

Good, solid family relationships not only provide strong sanctions against alcohol use, but also can have other positive effects. Such relationships can underlie better school adjustment, increase self-confidence, and, through those characteristics, increase the chances that a youth will become involved with peer clusters that are not abusing alcohol. For these reasons, family-based prevention could have many positive effects. It must be remembered, however, that family relationships are not strongly and *directly* related to alcohol use but only provide the base. Unless improved family relationships can lead to choice of nonalcohol-abusing peer clusters, there will be no strong effect on alcohol abuse. A family-based prevention program would do well also to focus on the next links in the chain.

The same principle applies to prevention programs based on improving identification with the Indian Way. The relationship between cultural identification and drug use is indirect. For a young Indian, cultural identification is closely tied to the family's stake in Indian culture. That stake is correlated with good family relationships and can influence drug use through that path. A strong stake in Indian culture also can relate to improved school success and increased self-confidence and, through these effects, can indirectly influence choice of peer cluster. A program that deals only with cultural identification and does not attend to strengthening these other paths will probably have little effect on adolescent alcohol abuse.

An ideal prevention program requires a total attack on the entire range of variables discussed. It would begin with those variables likely to occur earliest and have an indirect effect on alcohol abuse through other variables. These variables include family economic and educational status and the generally depressed and depressing status of the economy on Indian reservations. Next, such a program would focus on family relationships. An intact family has a better chance of providing strong sanctions against alcohol use. The family with a good income and parents with some education may have fewer problems, be able to spend more time with the youth, and be better able to attend to a young person's problems. Interacting with this might be cultural identification. The family that speaks an Indian language and engages in Indian activities develops a stronger stake in Indian culture. All these characteristics set the stage for good family relationships and for strong family sanctions against using alcohol. Strong family sanctions, in turn, encourage association with peer clusters that also provide strong sanctions against alcohol abuse.

Our results and other research indicate that family relationships, family education, and family economic status also may affect success in school. This success has at least two major effects, one on liking school, the other on self-esteem. Young people who like school seem more likely to associate with other youth who like school. They form peer clusters that have a low tolerance for deviance and tend to strongly discourage alcohol abuse.

School success also seems to increase feelings of being socially accepted and of self-confidence. These positive feelings, in turn, tend to reduce social isolation. Negative feelings of shyness, anxiety, and unhappiness, on the other hand, may increase social isolation. The youth who feels socially isolated is likely to develop associations with other young people with similar problems, and these young people together form peer clusters that encourage alcohol abuse.

In the long term, if alcohol abuse by Indian youth is to be prevented, many or all of these factors may need to be addressed. Some characteristics are fundamental and are so ingrained and resistant to change that attacking them as a means to reduce alcohol abuse is impractical. For example, changing the reservation economy potentially could affect family economics and education, eventually improve family relationships, and ultimately reduce alcohol abuse. As a natural experiment, it might pay to track economic changes, but it is not a practical manipulation. Other interventions are more feasible, e.g., programs that improve family relationships or school adjustment. It is critical, however, to ensure that whatever changes take place also affect peer associations.

The most practical and efficient attack may be aimed directly at those peer associations. Peer clusters do not exist independent of their members. Individuals influence the attitudes and behaviors of their friends. If they are shown how the influence process occurs and are motivated to exert positive influence, peer clusters might be susceptible to direct intervention, e.g., treatment analogous to family systems therapy.

A series of possible paths have been drawn to show how psychosocial characteristics could link together to encourage or discourage alcohol abuse. Although alternative path structures are possible, the paths created in this model are consistent with the results reported in this paper. Overall, the data and the theories provide a very strong psychosocial rationale for adolescent alcohol involvement. The correlations between alcohol use and psychosocial characteristics do not negate the importance of the potent biochemical effects of alcohol. Some people may be particularly susceptible to these properties. But even these persons must be brought into contact with alcohol and usually must develop drinking patterns that lead to high and continuous exposure to alcohol before they develop serious problems. Peer cluster theory states that involvement with alcohol by adolescents is not predicated on its biochemical effects alone, but is developed through creation of a potential for abuse by underlying psychosocial characteristics and is implemented through association with peers.

The results reported here provide some confirmation for the theory, showing that a wide range of psychosocial characteristics are significantly related to alcohol involvement of Indian youth–that negative characteristics are associated with high alcohol involvement while positive characteristics are associated with lesser involvement. In order to fully comprehend alcohol use by Indian youth, none of these dimensions can be safely ignored. Whether or not peer cluster theory eventually proves to be one of the better explanations of adolescent alcohol use, these results make it clear that any attempt to understand, predict, prevent, or treat alcohol use by Indian youth must consider psychosocial characteristics, in general, and the centrality and potency of peer relationships, in particular.

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Pass the Bottle, Bro!: A Comparison of Urban and Rural Indian Drinking Patterns

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ABSTRACT

After presenting a review of the literature on alcohol use and abuse among American Indians from the early 1950s until the present, this paper describes research on alcoholic beverage consumption among urban and rural American Indians and its relationship to selected demographic, psychological, and personal history variables. A total of 323 Indians of both sexes, representing four tribal affiliations (Navaho, Sioux, Eastern Oklahoma Indians, and California Indians) and residing in the Los Angeles area or in their respective rural or reservation homelands, were included in this study. The participants ranged from abstainers to very heavy drinkers. Current and former drinking frequency and quantity measures from partially overlapping samples (with lifetime abstainers included with current drinkers, on the one hand, and with now-abstaining former drinkers on the other) were subjected to multivariate analyses of variance and covariance. The effects on drinking of urban versus rural residence, tribal affiliation, and sex, as well as interrelationships with participants' age, proportion of Indian ancestry, psychosomatic stress (as measured by the Cornell Medical Index [CMI]), and drinking in the household of origin are assessed. The findings are discussed in relation to ethnographic observations and recent historical developments, as well as theoretical and policy implications.

Introduction

Alcohol abuse in American Indian communities is considered a major social, economic, and health problem by national tribal leaders, mental and general health service providers, and community members (Snake et al. 1977; Heath 1983). Alcohol abuse has been a continuing cultural phenomenon and social problem among Indian populations since colonial times (Dailey 1966). Accounts of the social and economic devastation attributable to alcohol abuse were included in missionary reports as early as the 1600s (Dailey 1968).

Until the 1950s, alcohol abuse among American Indians was thought to be essentially a contained, rural, subcultural concern. As a social problem, Indian alcohol abuse had only a peripheral impact on the dominant society. For example, there was a need for increased policing agencies and medical services in some small towns bordering "dry" reservations that cater to Indian demands for alcohol. In the 1950s, two major Federal policies greatly changed the dominant society's position regarding the American Indian and alcohol. In 1953, the Indian Non-Intercourse Act–a law that prohibited the sale of alcoholic beverages on Indian lands–was repealed. Thus, each reservation could decide whether to allow the sale of alcoholic beverages on its lands or remain dry. Further, in 1953, the Bureau of Indian Affairs inauguarated its now historic Relocation Program. In its 25 years of existence, relocation has changed the character of Indian life from containment in a collection of rural ghettos to bilocational and cyclically migrational lifestyles in two or more transhumant sites (U.S. Bureau of the Census 1982; Weibel 1978*a*).

By the 1980s, the adverse effect of alcohol abuse among Indians had become the equal concern of social workers and health service providers in urban areas, the Bureau of Indian Affairs, tribal intervention programs, and Public Health Service hospitals in rural and traditionally Indian catchment areas.

Historical and Theoretical Perspectives on Indian Drinking Behavior

Empirical observations of Indian drinking behavior, as well as the creative analysis of epidemiological data, have fostered the development of a generalized Indian drinking style model as well as theories about its possible cultural, psychological, sociostructural, and/or physiological and genetic etiologies. Cultural explanations of Indian drinking behavior propose that traditional social structures or belief systems either inhibit or accommodate alcohol consumption (Carpenter 1959; Dailey 1968; Kunitz and Levy 1974; Mohatt 1972). Other theorists propose that drinking styles are culturally transmitted, learned behavior and that the drinking style exhibited by most tribal members is the artifact of early drinking models, i.e., binge-drinking frontiersmen (Berreman 1956; Codere 1955; Curley 1967; MacAndrew and Edgerton 1969).

Other scholars have focused on the intrapsychic stresses that are the by-products of social and cultural change. Acculturation, deculturation, anomie, and relative deprivation are consistent themes in the research literature that attempt to identify causal antecedents of the inordinately high rates of excessive alcohol consumption and alcohol-related social and medical problems in Indian populations (Berreman 1956; Graves 1967; Herick 1970).

Social-structural theories propose that the special guardian-ward relationship which characterizes the political structure between the Federal and tribal governments fosters the well-documented Indian binge-drinking party (Heath 1964; Lurie 1971; Mosher 1975). This drinking style is reinforced by prohibitive laws which force Indians to drink their liquor supplies immediately in order to dispose of the evidence of their transgression (Officer 1971).

Pan-Indian Drinking Ethos—The Stereotype

Regardless of their theoretical position, observers describe Indian drinking behavior in broadly similar terms. The social characteristics of Indian drinking cliques are well documented (Dozier 1966; Heath 1964; Lemert 1954, 1958). The Indian drinking party is institutionalized social behavior in which the alcoholic beverages (usually beer or "bottom-of-the-line" wines) are rapidly consumed until the supply is exhausted or the drinkers "pass out" (Herick 1970). Binging, drinking to intoxication, displays of aggression, marked disinhibition, elevation of affect, and sexual license are said to characterize the Indian drinking party (Kemnitzer 1972; Lemert 1954). Few negative sanctions are placed on the abuser. Whittaker (1963) noted a tendency to excuse normally unacceptable behavior such as aggression and to allow the person to return to the group once he sobers up. Dailey (1966) has described American Indian drinking patterns as periodic and explosive, but not addictive.

Both ethnographic and epidemiological data have been used to denote intertribal and intratribal drinking pattern differences. Navahos are thought to drink more often and with biological and clan brothers as well as with maternal uncles and nephews rather than with nonrelatives (Heath 1964). Levy and Kunitz (1974) used epidemiological data to support their contention that while the ecstatic and public drinking style of the Navahos may result in violence and legal sanctions, relative acceptance of this behavior by Navaho society precludes high rates of major medical trauma reported among the more covert drinking of the Hopis.

The ecstatic quality of the Teton Sioux drinking party has been described in great detail (Kemnitzer 1972; Maynard 1969; Mohatt 1972). It has been suggested that, among the Sioux, intoxication simulates the supernatural strength gained through the vision quest and sun dance (Mohatt 1972). The Sioux called liquor "mni wakon," or "sacred water," in reference to its power to induce states of euphoria and to reduce pain and sadness. Alcohol may well fill psychological gaps left by the Sioux's loss of culture, personal worth, and esteem.

Stratton et al. (1978) also used epidemiological data to document significant variation in rates of problem drinking among tribal groups in Oklahoma. Two Oklahoma tribes (Creeks and Cherokee) have disproportionately low rates of alcohol-related deaths and arrests. Although the Cheyenne-Arapaho area has only around 2 percent of the total state Indian population, it incurs 20 percent of the total Indian alcohol-related deaths and about 10 percent of the arrests for public drunkenness. The authors suggest that the degree to which a culture was disrupted and the length of time of Anglo-Indian contact account for the degree to which alcoholic beverage consumption has been successfully incorporated and institutionalized into the tribal ethos. They agree with the Kunitz and Levy (1974) findings that in tribes where a positive value is placed on individual prowess and magical power, the mind-altering affects of alcohol will neither be rejected nor denied.

Intratribal drinking pattern differences have been accounted for by sex differences (Leland 1978; Burns et al. 1974; Weisner et al. 1984), socioeconomic level (Maynard 1969; Ferguson 1968; Graves 1967), and familial models of drinking behavior (Kuttner and Lorincz 1967; Weisner et al. 1984).

Urban Indians and Alcohol

In the 1950s, attempts were made to relieve population pressures on reservations. Encouraging Indians to relocate into urban centers became Federal policy (Officer 1971). Sufficient numbers of Indians took advantage of Federal relocation assistance such that there are now established Indian enclaves in several major American industrial centers. The Indian population is now almost evenly divided between urban and rural locations (U.S. Bureau of the Census 1982).

Abusive drinking and alcohol-related legal and medical sequelae of that behavior among urban Indian populations have been the subjects of considerable social scientific speculation and inquiry since the 1960s. Excessive alcohol consumption in urban Indian populations has been said to be a coping response to conflicting cultural and economic factors in a novel environment (Graves 1970; Hurt 1961; Littman 1970; Reinhard and Greenwalt 1974). Others suggest that excessive alcohol consumption among some urban Indians is not a response to urban stress, but rather a continuity of drinking patterns developed during adolescence and in rural places of origin (Ablon 1971; Weibel-Orlando et al. 1984). Research findings presented later in this paper and ethnographic observations suggest that most urban Indians have developed certain social control mechanisms which mitigate the more flamboyant aspects of reservation drinking as adaptive responses to the urban environment. These indigenous control mechanisms have led to an observable urban Indian drinking ethos (Weibel 1981; Weisner et al. 1984). Thus, the focus of this paper is the systematic analysis of the factors that influence drinking and that are common as well as unique to both urban and rural Indian populations.

Review of the Epidemiological Findings That Influenced the Research Design of This Study

A literature review on the issue of alcohol use and abuse among American Indian populations should start with the Mail and McDonald (1980) annotated bibliography on Native Americans and alcohol. Of the 969 references covered in this annotated bibliography, 158 present epidemiological data on American Indian drinking practices. In the 6 years since the publication of this useful bibliography, a few landmark and groundbreaking epidemiological studies of Indians, alcohol use, and the consequences of alcohol use have been conducted which deserve mention. For example, there have been studies on the incidence of fetal alcohol syndrome (FAS) among Indian births (May 1982; May and Hymbaugh 1983; May et al. 1983; Streissguth 1976; Jones et al. 1976), cirrhosis of the liver rates, especially among women (Malin et al. 1978; Day 1976), and a national study of youth drinking patterns (Rachal 1975). These studies herald the current direction of the epidemiology of alcohol-related medical consequences among Indian populations, present epidemiologic findings on urban and rural drinking patterns, and provide the basis for the selection of variables explored in the present study.

Alcohol-Related Arrests, Homicides, and Suicides

Much of the concern over excessive drinking by Indians is traceable to the sheer scope of the problem as well as to the relationship often observed between drinking and various other social problems. Graves' (1967) study of drinking patterns in a triethnic community found that alcohol intake of the Indians was almost seven times that of the Anglos and over three times that for persons of Spanish descent.

The most immediate area of conflict and stress is with the law (Schaefer 1973). Stewart (1964) found that, in 1960, 76 percent of all the Indian arrests in the nation were alcohol related. Bramstedt (1973), using Los Angeles Police Department data, found that nearly 90 percent of all adult Indian arrests from 1952 to 1967 were for intoxication. FBI uniform crime statistics showed arrest rates for urban Indians to be over 40 times greater than the rates for the Nation as a whole–38,461 versus 936 per 100,000 (Stewart 1964).

Reasons (1972) showed that 1968 alcohol arrest rates for rural and urban Indians were more than 20 times those of the general population. Graves (1971) calculated similar arrest rates for Indians in Denver. Indian drunk driving convictions in Los Angeles County were seven times greater than the proportion of non-Indian drivers (Pollack 1969). Forty-four percent of the men and 21 percent of the women interviewed in a 1974 Los Angeles study said they have or have had a drinking problem (Burns et al. 1974).

Early references to the epidemiology of accidents among American Indians (Omran and Laughlin 1972; Schmitt et al. 1966) indicate a pattern similar in most recent statistics for American Indian accident morbidity and mortality rates (U.S. Bureau of the Census 1975). Accidents continue to be the leading cause of death among Native Americans while ranking only fourth among non-Native Americans. Omran and Laughlin (1972) note that drinking is associated with most of the serious accidents and some fatalities among American Indians.

Everett (1970) was among the first to suggest an association of alcohol abuse and high rates of homicide among American Indians, in particular the Apaches, with whom he worked on the White Mountain Reservation. Westermeyer and Branter (1972) determined that violent death occurs five times more often among the Chippewa, with whom they worked, than among the general population of Minnesota. Additionally, violent deaths are more often associated with alcohol abuse among the Chippewa than among the general population. These 15-year-old figures are consistent with what is known about the Indian prison population today (Wolff 1980). Approximately 60 percent of the Indians in prison have been convicted for alcohol-related violent crimes such as homicide and attempted homicide.

The epidemiology of alcohol-related suicides among the Indian population reveals equally dismal mortality rates (Havinghurst 1971; U.S. Center for Studies of Crime and Delinquency 1973). Burnap (1972), for instance, indicates that 34 percent of all suicide attempts of Native Americans in the Aberdeen, North Dakota, area were alcohol related. Similar rates have been noted for Native Americans in the Northwest Territories (Butler 1966; Shore 1975) and on the Cheyenne River Reservation (Curlee 1969) as well as for the Shoshone-Bannock Indians in eastern California and Nevada (Dizmang 1968), the Eskimo in northern Alaska (Krause 1972), and the Oglala Sioux in South Dakota (Mindell and Stuart 1967). The most devastating suicide statistic is shared by the Papago of the American Southwest. Conrad (1974) notes that, among the Papagos, alcohol was involved in 8 of 10 successful suicides.

Most authors agree that Indian suicides are a result of the combined stresses of modernization, the loss of traditional cultural structures and activities, language, and community traditions, and an ambivalence about entry into 20th century technological society. Krause (1972) first mentions the changing pattern of suicidal behavior among the Eskimo. Traditionally, suicide was performed by the elderly; but, in more recent times, suicide has been greatest among Eskimos in the 15 to 25 age group.

Alcohol Use Among Indian Youth

Over the last 5 years, Indian youth patterns of drug and alcohol use and abuse have received much attention. National conferences concerned with the problem of substance abuse intervention become ultimately involved in discussions of prevention and intervention among target population youths. This topic, however, has been a concern of many researchers for at least the last 20 years.

Beede (1968), for instance, surveyed youths arrested in Seattle for delinquent behavior and drinking charges. Working with Anglo, black, and Native American youth, he found that social position (i.e., socioeconomic status) had a greater influence on drinking than ethnic identity. Minnis (1963) suggested the unusually high arrest rates for Native American youths in towns adjacent to the reservations may fuel the prejudice of the white townspeople and their social control agents. Parmee (1968), working among the Apache, indicated that during the summer months, 55 percent of all the juvenile arrests on the reservation were for one charge–disorderly conduct while under the influence of alcohol. In 1970, the Indian Health Service conducted an epidemiological study of the Reno-Sparks Indian colony in Nevada, just outside of Reno, and identified alcohol abuse as the only major health problem. Of the teenagers studied, 46 percent had started drinking before the age of 14. Similar kinds of statistics have been noted in other areas among teenagers (U.S. Indian Health Service 1973).

In the early 1970s, Pinto (1973) labeled drug use among Indian youth "a national scandal." The current literature indicates the continuing and endemic nature of alcohol abuse among American Indian youth. Additionally, a growing body of research has documented disproportionately high rates of polydrug usage (alcohol, inhalants, and drugs) among Indian youth vis-a-vis Angelo age cohorts (Goldstein et al. 1979; Winfree and Griffiths 1983; Frost et. al. 1984). Beer drinking predominates and is disproportionately higher among American Indian youth than among whites or any other ethnic minority group. Indian youths also use inhalants and marijuana at disproportionately higher rates. Their use of other street drugs, however, parallels the national norm. Factors such as peer group encouragement, laissez-faire child rearing practices, conflicts between cultural ideals and behavioral realities, parental and community attitudes about drug use, and the concomitant adult drug use models all contribute to a cultural matrix that either exacerbates or retards drug use among American Indian youth.

By far, most epidemiological studies of Indians and alcohol attempt to assess the level of drinking or the drinking patterns across diverse Indian groups or within a particular tribal or reservation area. These kinds of studies guided the selection of several variables which were explored in the present research. All too often, these epidemiologic studies have been overly concerned with defining and documenting the "Indian drinking problem." Eighty percent of the articles located in a literature search dealt specifically with alcohol use patterns. Less than 10 percent of the articles include discussions of multidrug use, and no article or report was devoted exclusively to a discussion of Indian adolescent street drug use.

An important group of studies on substance abuse among Native American youth has emanated from Alaska in recent years (Mendelsohn and Richards 1973, Alaska Native Health Board 1976*a,b*). The Alaskan studies focus on mental health problems and risk factors associated with adolescent alcohol abuse. While students at risk could be identified with a high degree of accuracy by five predictive factors, no differences were found between light and moderate-to-heavy alcohol abusers for any of seven target problems (i.e., homesickness, grief, isolation, reading disabilities, learning disabilities, feelings about their physical appearance, and boredom). There was, however, a higher incidence of boredom among abusers than nonusers.

Age at onset of drinking appears to be decreasing in Indian populations, paralleling recent national trends (Clark and Midanik 1981). The physiological effects of early drinking were dramatically shown by Sherwin and Mead (1975), who described the hospital admission of a 9-year-old boy due to the child's drinking abusively for 3 years in the company and with the apparent approval of his alcoholic father.

As mentioned earlier, research on Indian youth substance abuse is still disproportionately focused on alcohol abuse. While beer most often is the substance of choice, the lack of focus on other drugs is inconsistent with the extent of drug use among Indian youth. It is only in the last 12 years that the epidemic nature of gas, glue, and paint sniffing among American Indian youth was acknowledged beyond the confines of the reservations and the urban Indian communities (Strimbu et al. 1973).

The Wind River study included both Indian and Anglo adolescent populations (Cockerham 1975). Users of one drug demonstrated an increased probability to use other drugs. Indians were more likely than Anglos to be involved with alcohol, marijuana, and hard drugs, to get drunk more often, and to approve of using drugs other than alcohol. Forslund (1978) also worked with the Wind River population and found some statistically significant differences between Indians and Anglos on psychological measures of Personal Effect and Positive Social Characteristics. The use of alcohol to facilitate social activities appears to exist for both Indian and white youths. Adolescent Indian suicides continue to be a research concern (Dizmang 1974; Mendelsohn and Richards 1973). As mentioned previously, suicide is directly associated with habitual drinking, school dropouts, and chronic health problems. The youthful suicides victims shared common problems of acculturational stresses, "identity crises," and conflicts between traditional and modern values (Mendelsohn and Richards 1973).

Further attempts to explain inordinately high rates of juvenile offenses all underscored the alcohol and drug relatedness of the youthful crimes (Schaefer 1973; Jensen et al. 1977). Mendelsohn and Richards (1973) suggest that the public versus private nature of the adolescent Indian drinking party explains to some extent the high arrest rates for Indian youths. In a cross-ethnic study of black, Asian, Latin, Indian, and Anglo youths, Jensen et al. (1977) found that Indian youths drank and used drugs more than other youths and had the highest arrest rate for alcohol-related crimes.

Essentially, substance abuse among Indian youth is a social pressure phenomenon. Encouragement to drink by siblings is a critical factor in the early onset of drinking. Deviant behavior, unhappiness, or anxiety are not correlated with alcohol use. With widespread use of alcohol and drugs within the communities, few negative sanctions, and peer and sibling encouragement, there is little to prevent early experimentation and habituation (Oetting and Goldstein 1979).

The high rates of inhalant use among increasingly younger Indians pose a real health threat to this population (McBride and Page 1980). Use of inhalants occurs earlier than the use of most other drugs. Consistent with Albaugh and Albaugh's (1979) findings, early inhalant use may be a precursor of later heavy drug involvement, as the same attitudes lead to both phenomena (Oetting and Goldstein 1979).

Indian Drinking Styles

The largest genre of epidemiological studies has to do with the discovery of indigenously defined drinking styles or patterns and their distribution across populations. Leland (1975), working in Nevada, identified five drinking styles. Brown (1965), working in Taos, New Mexico, discovered three types of heavy drinking patterns: traditional, heavy, sociable drinking; two or three men drinking together; and an individual heavy-drinking style. Dailey (1966) describes three phases of Indian drinking: periods of deprivation, accommodation, and recreation.

In an important study of urban Indian drinking patterns, Burns et al. (1974) interviewed over 500 Native Americans in Los Angeles and identified three major categories of Indian drinking. Approximately one-third were total abstainers or rarely drank at all, another third were considered light-to-moderate drinkers, and about a third were considered heavy drinkers. Very few of the respondents identified themselves as alcoholic. Weisner et al. (1984) a decade later found similar patterns in their urban sample. They described three main drinking styles, wherein about 30 percent drank heavily, 40 percent drank in reasonable or controlled ways, and one-third did not currently drink at all. These drinking styles are referred to as "serious drinking," "white man's drinking," and "teetotaling," respectively. These terms were used indigenously by the urban sample in Los Angeles.

Dodson (1972) described two types of drinking which he called public and controlled drinking, wherein economic level was the most potent indicator of drinking style. Mindell (1967) also described two types of drinking among the population with which he worked: reactive or binge drinking and an addictive drinking style. Hill (1976), working with Winnebagos and Santee Sioux in Sioux City, Iowa, cautioned that there were many drinking norms, and the individual could shift norms or register with the environment. His landmark work emphasizes the necessity for understanding inter- and intratribal variation in drinking styles.

A second genre of drinking pattern epidemiological studies attempts to ascertain the percentage of Indian heavy drinkers who might be considered alcoholic. These figures vary widely and attest to the many issues in this kind of problematic study including: problems of "emic" versus "etic" definitions, the criteria by which alcoholism is measured, kinds of populations being measured, and how to assess cross-cultural comparisons.

To indicate the range of findings, Coult (1962), working among the Hualapai, considered 50 percent of the men in the population to be alcoholic. Dosman (1972) went even further, saying that alcoholism was so rampant that it should be eliminated as a criminal offense just to prevent the courts from clogging up. Turner (n.d.), working in Indian alcoholism intervention programs in Seattle, Washington, takes a more moderate view. In testimony to the National Institute on Alcohol Abuse and Alcoholism (NIAAA), he indicated that 25 percent of the Seattle Indian population could be labeled as alcoholic. In contrast, Duncan (1973) considered 6 to 10 percent of the Indian population with whom he worked to be alcoholic.

Another category of epidemiological studies compares Indian versus non-Indian drinking and/or alcoholism rates. Again, there is major disagreement among the researchers. Those who see major Indian/non-Indian differences include Forslund (1974), who found significant differences between the Anglo and Indian adolescent drinking patterns in his Wind River Reservation, Wyoming, study. Strimbu et al. (1973) found that Native American college students had the highest drug use of any ethnic group in their study. There are, however, a handful of studies dating from the 1960s that purport to find no significant differences between Native American and Anglo drinking patterns and rates of alcoholism (Nybroten 1964; Roy 1969; Smith 1966; Westermeyer 1972). In fact, Westermeyer found minor differences but major similarities between Native American and Anglo drinking practices and states that there is no validity in distinguishing between Indian-type alcoholism and Anglo-type alcoholism.

Other kinds of comparisons are made in the epidemiological literature. Sex of the participant is an important variable that is nearly always considered, with most epidemiological studies indicating that men drink more than women (Whittaker 1962; Coult 1962; Mail 1967; Cockerham 1975; Leland 1978). Thus, it seems logical to begin with a discussion of the onset of sex-based drinking pattern differences. In 1974, a drinking behavior questionnaire was administered to a large national sample of 13,122 Anglo, Hispanic, Asian, Indian, and black American youths (Rachal et al. 1975). In the survey, most drinkers in all ethnic groups drank moderately. Sex and ethnic differences appeared only at the extremes of the drinking range. As expected, abstinent girls generally outnumbered abstinent boys. Unexpectedly, the abstaining male/female ratio was greatest among the Indian sample. Although heavy-drinking boys outnumbered heavy-drinking girls in all five groups, the differences were greatest among the Asians and smallest among the Indians.

Among adolescent girls who did drink, however, heavy drinking was more prevalent among Indian girls. Closer examination of the ratios for heavy-drinking girls shows that nearly twice as many Indian girls drank heavily compared with the other ethnic groups. Of interest is the finding that, among heavy drinkers, the male/female ratios–in descending order of magnitude–were as follows: Asians, Hispanics, whites, blacks, and, finally, American Indians.

There are recent nationwide alcohol use prevalence data on black, Hispanic, and Anglo women (Clark and Midanik 1981). Unfortunately, the national survey does not include subsamples of Indians and Asians, particularly since Rachal et al. (1975) have indicated that Indian and Asian adolescent female drinking patterns fall at the high and low ends of the drinking spectrum. Lack of information about the drinking behavior of Asian and Indian women inhibits the development of a theory of drinking behavior socialization which could explore similarities and differences in adolescent and adult drinking patterns.

Leland (1984) tries to rectify the lack of comparable national comparison data for Indian females by comparing her Nevada findings with the national sample. She found that, as in the other ethnic groups, the majority of the Indian women were moderate drinkers. There were proportionately more heavy-drinking black and Hispanic women than Indian women. Finally, the ratio of heavy drinking men to women was greatest among Hispanics and Indians. In essence, Leland found an intermediate drinking pattern among the Indian women in the colony. These results are not consistent with the research findings presented later in this paper. However, there were important differences between the two studies in terms of sample selection procedures and the number of tribal groups that were included. Therefore, the generalizations stated here should not be interpreted as applicable to all Indian groups.

Another type of study compares urban versus rural drinking patterns. This literature generally supports the notion that urban stress promotes higher drinking levels than do rural environments (Reinhard and Greenwalt 1974; Westermeyer 1976). Other studies suggest that acculturation–the accompanying stress–might account for differences in drinking levels: comparisons of traditional versus modern lifestyle were thought to be appropriate. Most of these studies attempt to operationalize these problematic concepts in some valid way. Results tend to show, as Stull (1973) discovered, very little difference in drinking style across acculturation levels. Therefore, acculturation tends not to be used as an independent variable in more recent studies. In the present research, however, the level of stress, as measured by the Cornell Medical Index short form questionnaire, was found to be a useful barometer of drinking-associated psychopathology (Weisner et al. 1984).

Medical Consequences of Indian Drinking

A last genre of alcohol research on Indians is concerned with the medical consequences of abusive drinking. The alcohol research literature of the 1960s seemed to reflect the general social sentiment of the times: similarities, rather than differences between racial and ethnic groups were emphasized consistent with the prevailing civil rights movements. By the mid-1970s, the literature appears to take a distinct turn away from attempts to argue that Indian drinking patterns, and particularly alcoholism, mirror general population trends. Studies began to focus on differences between the drinking patterns of Indians and other groups as well as the legal and medical consequences of that drinking. For example, the U.S. Indian Health Service (1973) reported alcohol abuse among American Indians as the most significant medical and social problem confronting Indian communities. A U.S. Department of Health, Education, and Welfare report (1973) to Congress also described the problem of alcohol abuse as epidemic in American Indian populations.

Between 1973 and 1980, NIAAA supported the development of over 200 Indian alcoholism intervention programs. Increasingly, funds allocated for research projects focused on specific alcohol-related medical consequences in Indian populations, which generated another genre of Indian and alcohol studies. For example, cirrhosis of the liver mortality studies (Kunitz et al. 1971; Day 1976; Malin et al. 1978; Johnson 1980) indicate that cirrhosis of the liver occurs two times more often among Indians than in the general population. Cirrhosis of the liver is particularly prevalent among some Indian women subgroups. Malin et al. (1978) and Johnson (1980) report cirrhosis of the liver occurred 35 times more often among Indian women than Anglo women in the same age cohort. The recent evidence that Indian women may be at greater risk for alcohol-related liver impairment suggests that studies are needed on the effects of heavy alcohol consumption on unborn Indian children.

Smith et al. (1976) were among the first to suggest that an abnormally high ratio of the Indian women in their Seattle sample had either FAS or fetal alcohol effect babies. More recent work in this area has been accomplished by May and his associates (1983) in the Southwest. His work also emphasizes the importance of looking at inter- and intratribal differences. While the Hopi and Navaho tend to follow national norms for the incidence of FAS, the Apache have a high incidence of alcohol abuse and also tend to have a higher incidence of FAS. In fact, FAS appears to occur in 1 out of 50 Apache births, a staggering epidemiological finding.

Research on Urban-Rural Indian Drinking Patterns

Based on the foregoing epidemiological findings, a number of predictor variables of influencing factors were identified which could be used to construct a set of hypotheses on American Indian drinking patterns. The research described in this section represents the next step once baseline epidemiological data are established. This step entails the refinement of etiologic or correlational factors relative to alcohol abuse. The following variables were determined important to consider in the research described below: rural versus urban location, male versus female drinking behavior, age of the participants, family history of alcohol use, level of stress, degree of Indian heredity, and tribal background.

Data Collection

In 1978, Weibel and Weisner initiated a study of drinking practices of Indians located in California, as funded by the California State Department of Alcohol and Drug Programs and NIAAA. In the first year of the study, attention was focused on identifying antecedent factors which would help explain abstention and moderate and heavy drinking for 48 urban Navahos, 32 Sioux, 39 Eastern Oklahoma Indians, and 36 Indians from tribes indigenous to California. All participants were at least one-fourth Indian and were at least 18 years of age when interviewed. Approximately equal numbers of nondrinkers, light-to-moderate drinkers, and heavy drinkers were sampled in each tribe. Data for the study were collected principally through inperson interviews using a structured questionnaire.

In an earlier treatment of the data derived from the urban survey (Weisner et al. 1984), a research model using potential predictor variables was taken from the research literature which represented three broad, nongenetic theoretical orientations: sociostructural, cultural, and psychological predictors of drinking level. The following illustrates the research model.

In a similarly designed survey the following year, 124 participants from tribes indigenous to California were interviewed in four rural reservation areas in different parts of the State: two in southern California (the reservations and rancherias of San Diego and Riverside Counties), one in central California (the Tule River and Santa Ynez Reservations), and one in northern California (the Hoopa Valley Reservation). For this study, a comparison group for the urban California Indians was randomly selected from among these participants and was weighted to reflect the regional origins of the latter group. The resultant subsample of rural California Indians includes 42 participants: one-half are from southern California, one-third are from the central area of the State, and one-sixth are from northern California.

In 1982 Weibel-Orlando, together with Slagle of the Native American Studies Center at the University of California, Berkeley, administered a modified version of the drinking history interview to 41 Sioux on the Pine Ridge Reservation in South Dakota, 45 Navahos living on the Navaho Reservation, and 40 Cherokees in rural Cherokee communities in northeastern Oklahoma. These data, combined with the data from the urban sample and from the subsample of rural California Indians, allow for comparisons of drinking levels and factors which influence drinking behaviors and attitudes among four culturally distinct rural Indian populations and their urban counterparts.

To supplement the interview data, teams of American Indian students and community members were trained to systematically observe public drinking behavior in regular Indian social settings. Their observations provide the invaluable "insider's view" of Indian drinking contexts. Observations of Indian drinking behavior in urban settings occurred over two 15-month periods, from April 1978 to June 1979 and from September 1979 to December 1980. Less extensive observations of rural Indian drinking settings in the summers of 1979, 1981, and 1982 led to the discovery of both similarities and differences in urban and rural Indian drinking behaviors.

Demographic Profiles of the Urban and Rural Subsamples

As illustrated by table 1, rural Indians, as a group, tended to have more full bloods, be somewhat older, have less education, and live in somewhat more stable family units (i.e., more people are married, living together, or never have been married as opposed to more urban people who are separated or divorced). The urban sample tends to have spent more time in school. The most prominent difference between the urban sample and rural sample is the number of gainfully employed people, a factor which appears to strongly influence both frequency and amount of alcohol consumption as well as when during the week or month drinking usually occurs.

Comparing tribal subsamples, table 1 indicates that the Navahos are slightly overrepresented and the Sioux are slightly underrepresented in the urban sample. These ratios tend to approximate the tribal proportions in the total Indian population in Los Angeles (Burns et al. 1974). The Sioux and California groups tend to have much smaller percentages of full bloods than the Navahos and Eastern Oklahoma Indians, the overwhelming majority of whom are full bloods. Both the urban and rural Navaho and California samples have more women than men, while the male/female ratios are reversed in both the Eastern Oklahoma and Sioux samples. Interestingly, the proportion of unemployed participants is considerably higher in the rural Eastern Oklahoma and Sioux samples, but reversed in the Navaho sample. Topper (1982) presented a number of papers dealing with the availability of work on or near the Navaho reservation and the virtual lack of it on the Sioux reservations, which appear to be major influences on drinking behavior in both expected and unexpected ways.

Analysis of Study Data

In an earlier multiple regression analysis of drinking within the urban subsample, five variables were identified as the most salient in predicting participant drinking levels (Weisner et al. 1984). These measures were used as factors and covariates in this study as well as measures of residential location and tribal affiliation. Thus, the factor variables employed in each treatment were: urban versus rural residence, primary tribal affiliation, and sex. Covariates used include: each participant's age, proportion of Indian ancestry, psychosomatic stress as measured by the Cornell Medical Index (CMI) short form, and maximum level of drinking in the household of origin. The drinking measures employed as criterion variables were the self-report quantity and frequency scales developed by Cahalan, Cisin, and Crossley (1969) for a national survey of drinking behavior. The quantity of typical consumption measure ranges from zero (indicating none) to four (five or more drinks per occasion), and the 10-point frequency measure ranges from never to several times daily.

Findings

Current drinking. Tables 2 and 3 present mean current drinking frequency and quantity consumption scores, respectively, for each of the subsample cells. For most of the rural groups, drinking frequency means are below the sample means. Such scores indicate that, typically, the rural participants drink once or twice each month. Behaviorally, this finding translates into the 1st and 15th of the month, when lease money, unemployment, welfare, and/or general assistance payments typically arrive. Frequency means for the urban subsample, on the other hand, tend to be higher. Although the urban drinking frequency distribution, overall, is skewed slightly by a small number of habitual "skid row" drinkers, the group means are consistent with the modal urban score of six, which represents one or two drinking sessions per week. This pattern coincides with pay schedules in urban-based industries and social services (i.e., the Friday night paycheck). The higher rates of employment among rural Navahos and California Indians may contribute to the similarity in drinking frequency of men in those groups and the urban majority.

Table 1.—Demographic comparison of the urban and rural subsamples by tribal affiliation

	Urban					Rural				
Data item	All tribal groups	Navaho	Sioux	East Oklahoma	California	All tribal groups	Navaho	Sioux	East Oklahoma	California
Percent of sample	48.0	14.9	9.9	12.1	11.1	52.0	13.9	12.7	12.1	13.0
Percent males	50.3	45.8	59.4	59.0	38.9	48.2	48.9	51.2	50.0	42.9
Percent full bloods	64.5	89.6	46.9	82.1	27.8	71.4	95.6	53.7	95.0	40.5
Percent married	37.4	37.5	31.3	48.7	30.6	49.4	42.2	46.3	57.9	52.4
Percent not gainfully employed	37.4	37.5	46.9	33.3	30.6	51.2	28.9	75.6	57.5	42.9
Mean years of age	36.9	33.0	38.5	42.6	34.3	42.3	36.8	44.9	45.8	42.3
Mean years of school	12.7	13.1	12.6	11.8	13.2	10.9	12.1	9.9	9.9	11.5
N	(155)	(48)	(32)	(39)	(36)	(168)	(45)	(41)	(40)	(42)

Table 2.–Mean frequency of drinking by residential location, tribal affiliation, and sex for current drinkers and lifetime abstainers

Residential location/tribe	Urban Male	Urban Female	Rural Male	Rural Female
Navaho				
Mean	7.80	3.71	6.00	3.89
S.D.	(2.10)	(2.63)	(1.69)	(1.83)
Sioux				
Mean	7.33	6.89	4.38	4.93
S.D.	(2.24)	(2.67)	(2.70)	(2.15)
East Oklahoma				
Mean	6.67	3.45	4.58	4.57
S.D.	(3.98)	(2.50)	(3.58)	(3.86)
California				
Mean	6.90	5.65	6.92	4.28
S.D.	(2.08)	(1.73)	(2.47)	(2.30)

Note: Sample mean = 5.30; S.D. = 2.90; N = 206.

Table 3.–Mean quantity consumed by residential location, tribal affiliation, and sex for current drinkers and lifetime abstainers

Residential location/tribe	Urban Male	Urban Female	Rural Male	Rural Female
Navaho				
Mean	3.40	1.95	3.88	3.00
S.D.	(.84)	(1.46)	(.35)	(1.22)
Sioux				
Mean	3.78	3.44	2.44	3.07
S.D.	(.44)	(.73)	(1.36)	(1.33)
East Oklahoma				
Mean	3.33	1.82	2.42	2.28
S.D.	(1.18)	(1.25)	(1.83)	(1.82)
California				
Mean	3.90	2.94	3.42	2.83
S.D.	(.32)	(.75)	(.79)	(1.54)

Note: Sample mean = 2.89; S.D. = 1.35; N = 206.

A majority of the urban groups' quantity of consumption mean scores, as shown in table 3, approach the maximum scale score of four (i.e., five or more drinks per occasion). Half of the rural groups have means of three or higher. The latter, when considered along with the average rural frequency of drinking, is consistent with what has come to be described as the Indian binge-drinking pattern (Ferguson 1968). The high urban averages are, in part, attributable to the "skid row" respondents in that subsample. In fact, a much larger proportion of urban rather than rural drinkers report drinking no more than two drinks per session, reflecting a growing trend among some urban Indians toward what is called "maintaining," or limiting alcohol consumption and monitoring self-presentation so as to avoid problems with legal authorities or other drinkers.

Table 4 presents the results of the multivariate analysis performed on this distribution of current drinking frequency and quantity scores. As indicated, sex is the only factor clearly discriminating both drinking scores: men drank more often than women. Sex also yielded a significant interaction effect with residence for the quantity measure: the magnitude of the difference in amounts consumed between the sexes was much greater in the Los Angeles area than in the rural areas. Furthermore, among the rural Sioux, women actually drank somewhat more frequently than men. Residence also had a significant effect in the multivariate analysis, stemming from the urban groups' higher frequency of drinking. Tribal affiliation, by itself, had no significant effect in the analysis, but it did interact significantly with location. Rural Navahos (both men and women) and women from the Eastern Oklahoma tribes consumed somewhat more per drinking occasion than their urban counterparts. The rural Eastern Oklahoma women also drank more often than their urban counterparts.

The four covariates, in a joint within-cells regression on the drinking measures, produced a significant effect in both the multivariate and univariate analyses. High levels of drinking in the household of origin correlated slightly with drinking frequency, while high CMI scores were strongly associated with heavy consumption and frequency levels.

Tables 5 and 6 contain the cell mean scores for past drinking frequency and past quantity of consumption per occasion reported by abstainers (including former drinkers) among the participants. The results of the multivariate analysis performed on these scores are presented in table 7. As noted above, several of the cells contain scores for fewer than five respondents; thus, the results of the analysis should be interpreted cautiously. All three factors have a significant multivariate effect, and only the place of residence variable is not significantly related to both former drinking scores in univariate analysis. Men among the former drinkers generally drank more often than women, and former drinkers from the Eastern Oklahoma tribes drank significantly less often and consumed smaller quantities than other groups. Urban participants tended to drink more frequently, and more per occasion, than rural participants.

In contrast to the results of the treatment of current drinking scores, the covariates have no significant effect on the joint distribution of the past drinking measures. CMI scores tend toward the same association with higher drinking levels, but only to a nonsignificant degree; only the within-cells regression of drinking in the household of origin is significantly related to past frequency of drinking for former abstainers.

Discussion

Several drinking patterns have emerged from this analysis. As in most studies of drinking patterns, male/female differences are clearly defined. Across all tribal groups and locations, except the Sioux, women drink substantially less than their male cohorts. The Navaho and Oklahoma women tend to drink even less often in the urban setting, while the Sioux and California women drink more often. The Sioux women, indeed, provide the most obvious case of a negative instance (Mead 1928). In urban settings, Sioux women drink almost as much and almost as frequently as do the men. In the rural sample, the Sioux women report they drink *more* frequently than do the men.

To explain this pattern, ethnographic and ethnohistorical data on the Sioux should be reviewed. First of all, only 25 percent of the rural Sioux sample were employed at the time of the interviews. While this employment rate seems abysmally low, it is, in fact, fairly consistent with the seasonal and sporadic nature of employment on the Sioux reservations. With little gainful employment available, with their school-aged children often left in the care of grandparents or other family members, and with various kinds of supplemental financial assistance, the young Sioux women have ample time for "partying" with their friends whenever funds are available. The now familiar drinking party has become routinized adult recreation for large segments of reservation-based Sioux men and women.

Table 4.–Drinking frequency and quantity consumed among current drinkers and lifetime abstainers

MULTIVARIATE ANALYSIS OF VARIANCE AND COVARIANCE

		F	df	*p*
Urban versus rural residence		4.72	2, 185	.01
Univariate effects	quantity	.06	1, 186	n.s.
	frequency	5.34	1, 186	.03
Tribal affiliation		1.69	6, 368	n.s.
Univariate effects	quantity	2.56	3, 186	n.s.
	frequency	1.93	3, 186	n.s.
Effect of sex		8.18	2, 185	.001
Univariate effects	quantity	11.10	1, 186	.001
	frequency	16.00	1, 186	.001
Residence by tribal affiliation		2.22	6, 368	.05
Univariate effects	quantity	2.56	3, 186	n.s.
	frequency	.45	3, 186	n.s.
Residence by sex		2.42	2, 185	n.s.
Univariate effects	quantity	4.61	1, 186	.04
	frequency	1.40	1, 186	n.s.
Within cells regression effect		3.64	8, 368	.001
Univaraite effects	quantity	4.74	4, 368	.001
	frequency	7.58	4, 186	.001

WITHIN CELLS REGRESSION ANALYSIS

	Dependent variable			
	Quantity		Frequency	
Covariates	*T*	*p*	*T*	*p*
Age	-1.77	n.s.	-1.54	n.s.
Proportion Indian ancestry	-.17	n.s.	-.31	n.s.
CMI score	3.41	.001	4.46	.001
Drinking in household of origin	1.74	n.s.	2.43	.02

Note: The three-way interaction effect and the tribal affiliation by sex effect were nonsignificant and are omitted from the table.

n.s. = not significant.

Table 5.—Mean frequency of past drinking by residential location, tribal affiliation, and sex for former drinkers and lifetime abstainers

Residential location/tribe	Urban Male	Urban Female	Rural Male	Rural Female
Navaho				
Mean	9.20	3.40	9.75	3.00
S.D.	(2.05)	(4.43)	(2.50)	(2.64)
Sioux				
Mean	9.88	7.00	4.00	4.83
S.D.	(1.64)	(3.46)	(3.16)	(3.97)
East Oklahoma				
Mean	7.00	1.50	3.63	2.54
S.D.	(4.43)	(3.00)	(3.01)	(2.54)
California				
Mean	10.00	8.50	5.83	3.38
S.D.	(0)	(2.89)	(.75)	(3.11)

Note: Sample mean = 5.31; S.D. = 3.95; N = 99.

Table 6.—Mean past quantity consumed by residential location, tribal affiliation, and sex for former drinkers and lifetime abstainers

Residential location/tribe	Urban Male	Urban Female	Rural Male	Rural Female
Navaho				
Mean	4.00	1.30	4.00	2.00
S.D.	(0)	(1.77)	(0)	(1.73)
Sioux				
Mean	3.88	3.33	2.57	3.00
S.D.	(.35)	(.58)	(1.81)	(1.55)
East Oklahoma				
Mean	2.86	.50	2.36	.91
S.D.	(1.57)	(1.00)	(1.91)	(1.14)
California				
Mean	4.00	3.50	4.00	2.50
S.D.	(0)	(1.00)	(0)	(2.07)

Note: Sample mean = 2.58; S.D. = 1.71; N = 99.

Table 7.—Drinking frequency and quantity consumed among former drinkers and lifetime abstainers

MULTIVARIATE ANALYSIS OF VARIANCE AND COVARIANCE

		F	df	*p*
Urban versus rural residence		17.04	2, 78	.001
Univariate effects	quantity	.71	1, 79	n.s.
	frequency	15.92	1, 79	.001
Tribal affiliation		2.64	6, 154	.03
Univariate effects	quantity	4.69	3, 79	.01
	frequency	2.96	3, 79	.04
Effect of sex		9.07	2, 78	.001
Univariate effects	quantity	17.79	1, 79	.001
	frequency	15.78	1, 79	.001
Within cells regression effect		1.64	8, 154	n.s.
Univariate effects	quantity	1.98	4, 79	n.s.
	frequency	2.81	4, 79	.04

WITHIN CELLS REGRESSION ANALYSIS

	Dependent variable			
	Quantity		Frequency	
Covariates	*T*	*p*	*T*	*p*
Age	-1.00	n.s.	-1.00	n.s.
Proportion Indian ancestry	-.54	n.s.	-.29	n.s.
CMI score	1.70	n.s.	1.96	n.s.
Drinking in household of origin	1.68	n.s.	2.51	.02

Note: Interaction effects were nonsignificant and are omitted from the table.
n.s. = not significant.

In contrast, among the Eastern Oklahomans, men and women are both at the low end of the drinking spectrum. As Stratton et al. (1978) have pointed out, the heavy fundamentalist Christian influence among the Eastern Oklahoma tribes is a deterrent to excessiveness of any sort and, in particular, excessive consumption of "demon rum." Sociocultural and economic factors unique to each area appear to be factors which precipitated the demonstrated tribal differences in drinking levels.

Socialization into culturally acceptable drinking behavior and its modeling by significant others, principally in the family of origin, were not as strongly indicated by this data set as they had been in our earlier analyses. While it is true that current abstainers who are former alcohol abusers reported growing up in families where at least one parent drank heavily, the actual incidence of this type of family modeling of drinking behavior was not reported as often as was predicted. Again, the ethnographic record provides insight. Children of heavy-drinking, divorced, or working parents are often brought up in the homes of their grandparents, aunts, or uncles. This cross-generational caretaking often provides more culturally conservative and traditional home lives. While their parents are out working or "partying," the older grandparents have long since given up the drinking party for more traditional forms of social life. Curvilinear lifetime drinking patterns are normative for drinkers (i.e., gradual escalation of drinking into middle age, and reduction or abstinence in old age). Hence, a pronounced discrepancy is apparent between reports of relatively little drinking in childhood homes and the individuals' current levels of alcohol consumption.

The binge-drinking pattern is strongly indicated in the rural samples. Heavy, sporadic alcohol consumption has led to the dramatic accidental death records which plague most rural Indian health providers and law officers. Urban Indians, perhaps because of both the availability of alcohol beverages and the more stable and frequent employment opportunities, drink more frequently with only some modification in the amount consumed.

The relationship of several socioeconomic variables with drinking in the original analysis of data from the urban sample has been investigated (Weisner et al. 1984). In that analysis, it was found that the measures described in this paper, when used as controls, largely diminished the relationships between drinking and the socioeconomic variables. Ethnographic observations, as well as the difference in drinking patterns when rural and urban samples are compared, suggest that socioeconomic factors cannot be dismissed. These relationships will continue to be addressed by ongoing analyses.

The urban drinking profile is skewed by a small number of people who drink in chronic and habituated ways. Are their chronic drinking histories reflections of high stresses incurred in the urban environment? It does not appear so. A review of the life histories of urban Indians who drink habitually indicates well-established drinking careers prior to migration. Were they "pushed" off the reservations and into the cities, or were the anonymity and special services available in the city to indigents the attractions or "pulls" that brought them into the city? Ethnographic observations and life history data indicate that both forces impelled the rural-to-urban migration of these Indians. It must be kept in mind, however, that these people are few in number and are not representative of the majority of the urban Indian population who drink.

Finally, the immediate and devastating effects of sporadic binge-drinking parties characteristic of the rural areas (i.e., automobile accidents, homicides, accidental shootings, household accidents, and child and spouse abuse) are well documented by the epidemiological data, greatly discussed, and universally deplored. The more long-term medical effects of regular consumption (two to four times a week) of three or more drinks characteristic of urban Indian drinking are less well-known. Further longitudinal and biomedical research as well as intervention are needed in this area.

Most practitioners of the heavy alcohol consumption pattern indigenously labeled "maintaining" do not view their drinking as particularly dangerous, let alone "alcoholic" behavior. However, what we know about the association of long-term heavy alcohol consumption with cirrhosis of the liver, hypertension, and cognitive impairment suggests that "maintainers" may, indeed, be placing themselves at risk. A next logical research step seems to be documentation of the psychological and physiological effects of this predominant and potentially destructive urban Indian drinking style.

Conclusions and Recommendations

The need for comparative research focused on the cultural factors which either impede or contribute to dysfunctional alcohol consumption is underscored by data on Sioux women. Future epidemiological research needs to be sensitive to factors which lead to inter- and intragender differences in drinking behavior. Furthermore, these studies need to recognize the sociocultural influences of different Indian tribes on drinking styles.

In addition, there needs to be a process for collecting epidemiological data on alcohol-related Indian morbidity rates on a nationwide basis. Because of the data collection and retrieval system of the National Center for Health Statistics, there is good information on alcohol-related mortality rates. Both the research and service delivery communities have used these statistics to promote intervention programs and to justify research expenditures.

The hierarchical structure of the IHS is uniquely designed for mandating, administering, and executing the collection of data on alcohol-related illness or impairment. The Indian Health Service could develop a diagnostic panel of laboratory tests and clinical observations to identify physiological parameters altered by alcohol ingestion. This objective panel and clinical survey could be administered to everyone upon admittance to any service unit under the IHS umbrella at least once a year. These data could be systematically entered into a service-wide data bank and the findings reported to both the presenting patient and the attending medical staff. These data could provide the following:

1. A diagnostic tool by which the interventionist, whether a physician, nurse, or alcoholism coun-

selor, can begin to talk about the individual's alcohol abuse as a health problem (the disease model)

2. A clearer indication of the range and severity of the effects of alcohol abuse in the Indian population by sex, age, tribe, and location
3. Alcohol-related morbidity rates that can be compared with accuracy to national health statistics so that valid, rather than speculative, statements can be made about alcohol-related malaise among Indians
4. Information about populations with sizable proportions of persons at risk for alcoholism. This information would allow service delivery planners to subsequently mobilize and target their services so as to adequately address regional variations in service needs
5. Supporting documentation on the severity and ubiquity of the problem that could serve as an effective and persuasive tool in the Indian Health Service's annual requests for an operative budget.

With the support of appropriate research, progress can be made in the reduction or even elimination of alcoholism among American Indians, so that by the year 2000 it may be said that "alcoholism *used* to be an Indian disease."

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Alcohol Abuse and Major Affective Disorders: Advances in Epidemiologic Research Among American Indians

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ABSTRACT

A multistage study was conducted to assess the reliability and validity of a modified version of the NIMH Diagnostic Interview Schedule (DIS) and of the Schedule for Affective Disorders and Schizophrenia–Lifetime Version (SADS-L) within a known cases/noncases matched-control design that involves tribal members of three reservation communities. The long-range objectives of this effort include developing culturally sensitive diagnostic instruments to be used in community-based psychiatric epidemiologic studies with these American Indian populations. The particular phase of the study reported in this paper relates to the standardized psychiatric interviews of mental health clinic index groups that were constructed at each of the sites. Data derived from 86 interviews are presented, with special attention given to questions about variations in alcoholism symptoms as well as "caseness" among individuals with histories of major depression. The implications of these data for future epidemiologic research on alcoholism within American Indian communities are discussed in terms of issues pertaining to diagnostic criteria, multiple concurrent diagnoses, diagnostic primacy, and instrumentation.

Introduction

Few community-based psychiatric epidemiologic studies have been conducted on alcohol abuse and dependence among American Indians. Surveys of drinking style and patterns of consumption dominate the existing literature. These efforts suffer from serious problems that limit their utility as a basis for future epidemiologic research. First, previously employed alcohol-use screening instruments are of unknown discriminant validity with respect to abuse and dependence (Walker et al., in press). Second, past inquiries, with few exceptions, examine behavioral "events" and ignore the question of clinically meaningful "cases," and subtypes thereof, that may have important implications for treatment (Westermeyer et al. 1981). Third, different methods of assessment seldom are compared in the same study, so the relative advantages of various instruments remain unknown. Fourth, many investigators assume that alcohol abuse and dependence necessarily occur independently of other forms of serious psychological dysfunction or major mental disorder such as depression; hence, the synergistic effects of these conditions remain undetermined as possible risk factors for relapse or as predictors of the length and course of treatment (Shore et al., manuscript in preparation). Finally, the explanatory models that underpin criteria applied in judging American Indian drinking behavior rarely have been examined in terms of Indian cultural constructions of serious psychological dysfunction or major mental disorder (Manson et al. 1985; Medicine 1982). As a result, work in this area threatens to restrict itself to "normative" studies of existing measures of alcohol abuse/dependence, thereby characterizing the Indian experience within an increasingly more precise but alien conceptual framework.

This paper discusses a study that addresses some of these shortcomings in state-of-the-art epidemiologic research on alcohol abuse and dependence among American Indians. The phase of the study reported concerns standardized psychiatric interviews (Schedule for Affective Disorders and Schizophrenia–Lifetime Version [SADS-L]) of mental health clinic index groups drawn from three distinctly different American Indian reservations. Data from these interviews (N = 86) are presented, with special attention given to questions about variations in symptoms of alcoholism as well as "caseness" among tribal members with histories of major depression. The implications of these data for future epidemiologic research on alcoholism within American Indian communities are discussed in terms of issues pertaining to diagnostic criteria, multiple concurrent diagnoses, diagnostic primacy, and instrumentation.

The significance of the present study becomes apparent in light of the limited nature of previous work with American Indians that has any bearing on the relationship between alcohol and affective disorders, as well as related epidemiologic concerns. This work is embodied in a meager set of studies that employed self-report measures such as the Minnesota Multiphasic Personality Inventory (MMPI), Zung Depression Scale, and the Health Opinion Survey to either evaluate the psychological status of select samples of Indian alcoholics or for case-finding purposes in community-based surveys.

The MMPI has had a long history of use with American Indians, dating to the developmental phase of the original scales (Arthur 1944). Moreover, mental health professionals in the Indian Health Service (IHS), the largest single provider for this special population, employ this particular diagnostic tool more frequently than any other to assess patients. Despite early and extensive interest in the MMPI, few studies have been conducted that provide consistent, clinically meaningful insight into the psychological correlates of alcohol abuse/dependence among American Indians.

Uecker and colleagues (1980) conducted a controlled comparison of the MMPI profiles of 40 Indian and 40 white veterans being treated for alcoholism in an inpatient setting. Their results revealed similar mean profiles for the two groups, with slightly higher elevations for the white patients on the psychopathic deviate (Pd) and masculinity-femininity (Mf) scales. Uecker and coworkers concluded that the Indian patients' MMPI profiles were congruent with those reported for treated alcoholics in general. Page and Bozlee (1982) described similar findings from their study of 11 white, 11 Hispanic, and 11 American Indian alcoholics seen in a Veterans Administration residential treatment program. An elevated Pd scale was common to all three patient groups and is said to be consistent with the characterological features frequently attributed to the alcoholic population. The investigators noted an unusual absence of elevated Pd scale combinations among the Indian patients and speculated about the less characterological and more neurotic features of this group relative to the white and Hispanic patients.

Butcher and colleagues (1983) systematically compared MMPI scale scores and mean profiles for 97 black, 454 white, and 36 American Indian psychiatric inpatients, including alcoholics, treated at a major medical center in Minnesota. Examining the total groups, as well as subsamples matched on the basis of socioeconomic status, they found significantly higher scores for blacks than for either whites or Indians on the frequency (F), paranoia (Pa), schizophrenia (Sc), and hypomania (Ma) scales. Indian patients never scored significantly higher than white patients on any of the scales. Indeed, significantly lower scores for Indian patients than white patients on the psychasthenia (Pt) and Sc scales, in combination with the previously mentioned pattern for blacks, prompted the researchers to infer that the MMPI does not "overpathologize" nonwhites and that group differences in MMPI scores probably reflect self-reported symptom differences for certain types of psychopathology, including alcohol dependence.

Kline and associates (1973) administered the MMPI to 30 male Indian alcoholics being treated in an inpatient program. One-third of the respondents had five or more total (T) scores above 70; two-thirds of the respondents had three or more T scores above 70. The researchers observed consistent elevation of the F, Pd, and Sc scales. The greatest degree of pathology was evidenced among respondents with a major elevation of the Sc scale; the least was evidenced among those with elevated Pd and depression (D) scales. The MMPI profiles of the respondents in this study were significantly more elevated than those of a presumably comparable group of white alcoholic patients. Sufficient ambiguity in the meaning of scale elevation and the diversity of patient profiles led Kline and his colleagues to question the utility of the MMPI as a screening tool for American Indian alcoholics. In sharp contrast to the three studies described above, they called for the development of MMPI norms specific to this special population.

Pollack and Shore (1980) reported findings from a study of the MMPI involving 142 American Indian psychiatric patients seen by various clinics in the Portland Area Indian Health Service. The mean profile for the respondents reflected significant elevations in the F, Pd, and Sc scales, with the Pd and Sc scales consistently among the three highest for the 11 different subgroups (defined by age, sex, diagnosis, and culture area) that were of interest to them. Differences by age, sex, diagnosis–including alcoholism–and culture area were observed in degree of apparent pathology as reflected in the relative elevation of scale scores. However, Pollack and Shore thought that the overriding similarity of profiles across all the subgroups suggests that the MMPI performs differently with American Indians than with white psychiatric patients and that, among the former, cultural factors mask pathological differences.

Westermeyer and Peake (1983), in their 10-year followup study of 42 American Indians admitted for alcohol-related problems to the University of Minnesota Hospital describe one of the rare instances in which a measure other than the MMPI was employed to appraise the possible relationship between alcohol-related problems and depression. The original assessment covered drinking and psychiatric history, physical health, psychological (MMPI) and mental status, hepatic function, and sociodemographic factors. The second assessment included clinical ratings of substance abuse (Michigan Alcoholism Screening Test, the Drinking Behavior Interview, and the Cohen-Klein drug use scale) as well as a measure of depression (Zung Self-Rating Scale). Zung Depression Scale scores consistently were lower when subjects were asked to compare how they felt during periods of nondrinking as opposed to periods of heavy drinking. Moreover, Zung Depression Scale scores also varied in the expected direction, depending upon changes in functional status since initial assessment.

Only one psychiatric epidemiologic study of an American Indian community has been conducted on a population-wide basis. Shore and coworkers (1973) interviewed one-half of the adult Indian population in a Pacific Northwest coastal village. Two psychiatrists administered a 70-item questionnaire to 100 residents during a 6-month period. The sample was selected across family living units with respect to village geography and was controlled to yield a representative distribution of subject sex and decade of life. The questionnaire had nine parts, including the Health Opinion Survey, antisocial and drinking-pattern inventories, a psychotic scale, demographic data, and medical history. Interviewers gathered additional information through nondirective discussions. The local physician and a significant other were questioned to corroborate the subject's answers.

Primary symptoms and behavioral patterns then were abstracted from these multiple sources. Based on such abstracts, two psychiatrists independently rated each subject on whether, in their opinions, that person was psychiatrically disturbed (four-point scale ranging from none to severe) and assigned a psychiatric diagnosis (employing American Psychiatric Association standards). Interrater reliability was found to be satisfactory in all three areas of assessment. Presence of psychiatric disturbance and severity of impairment did not vary significantly by subject sex. However, a larger proportion of young subjects of both sexes were rated as more psychiatrically disturbed than their older counterparts; the same was true for severity of impairment. The following distribution of major mental disorders was reported: alcoholism, 31 cases; psychoneurosis, 18 cases; psychophysiologic reaction, 9 cases; transient situational reaction, 6 cases; nonpsychotic organic brain syndrome, 2 cases; and personality disorder, 2 cases.

Shore and colleagues underscored the extent to which the adult male segment of the population was severely impaired by alcoholism. Indeed, a high prevalence of alcoholism among young adult males and females accounted for their disproportionate representation among the severely impaired. The authors also noted clusterings of psychoneurotic problems among alcoholic males and of psychophysiologic illnesses among neurotic females. The findings from this particular study, combined with the lack of clear advances along other lines of inquiry, served as the impetus for the effort reported in this paper.

Method

Study Purpose and Design

A multistage study, partially described herein, was conducted to assess the reliability and validity of a modified version of the NIMH Diagnostic Interview Schedule (DIS) and the SADS-L within a known cases/noncases matched-control design that involves tribal members of three reservation communities. The long-range objectives of this effort include developing culturally sensitive diagnostic instruments to be used in community-based psychiatric epidemiologic studies with these special populations.

The study began by eliciting cultural conceptualizations of serious psychological dysfunction and/or major mental disorder from three different reservation communities representing the Pueblo, Plateau, and Plains culture areas in North America. These indigenous categories of illness and culturally meaningful symptoms were incorporated within an interview schedule that included select sections of the DIS that had been modified through extensive reviews by local health/mental health professionals and paraprofessionals. The resulting protocol, hereafter referred to as the Indian Depression Schedule (IDS), was patterned after the DIS in terms of its logic of inquiry and response format. The SADS-L subsequently was employed to identify a clinically depressed index group (CIG) of tribal members from each reservation community. Individuals who, in the opinion of local health/mental health professionals, exhibited significant signs of depression were interviewed by one of four research psychiatrists using the SADS-L. Respondents diagnosed as depressed constituted the index group that serves as the criterion referent. The IDS then was administered to the CIG and to a matched community group (MCG), the members of which were matched with the former on a 2:1 basis according to age and sex. Previous clinical experience suggested that response patterns might vary along these lines and, for the study's purposes, needed to be controlled. The matched community samples from two reservations, specifically the Pueblo and Plains sites, were screened and drawn from general outpatient medical clinics. The MCG at the Plateau site was derived from a random sampling of tribal rolls. The interviews were conducted by local mental health paraprofessionals who received extensive training in the protocol.

To date, the overall design of the study and partial findings from the Pueblo site have been described (Manson et al. 1985). Another report (Shore et al., manuscript in preparation) details the nature and pattern of depression as reflected in the SADS-L interviews conducted among CIG members across the three study sites.

Instrumentation

The central diagnostic instruments in the present study include the IDS, which incorporates certain sections of the DIS, and the SADS-L. The DIS is a highly structured instrument that was designed to allow lay interviewers (with 1 week of training) to render 26 psychiatric diagnoses according to DSM-III criteria, Feighner criteria, and Research Diagnostic Criteria (Robins et al. 1981). The DIS employs a descriptive rather than an etiological approach to diagnosis: clear standards of severity of symptoms, the exclusion of physical illness, medical experiences, and drug or alcohol use as potential explanations of symptoms, and explicit interviewer probes that reduce information variance. The DIS generates diagnoses on a lifetime basis and indicates if the disorder is current or defined for four time periods: the past 2 weeks, the past month, the past 6 months, and the past year. The DIS also determines the age at the last symptom(s), the age at which the first symptom(s) emerged, and whether medical care was ever sought for any of the symptoms of the disorders in question. Morever, the DIS yields a total symptom count across diagnoses and a count of the number of criteria met for each diagnosis, whether positive or not.

The IDS consists of five sections. The first section contains an extensive set of biodemographic items including questions on age, sex, marital status, family size, recent deaths, residential pattern, religious affiliation, education, occupation, and brief medical history. Questions specific to community life address such matters as tribal and clan membership, blood quantum, languages spoken and fluency, and participation in ceremonial activities. The second section consists of a series of linked, recurring questions about one's knowledge of and personal experience with indigenously defined illnesses. It asks whether the respondent is familiar with any of the indigenous categories of illness and about their meaning; whether the respondent has ever used any of the categories to describe someone else and the circumstances; whether the respondent had ever felt these ways, and if so, why; if it were to be expected; and the normal frequency of occurrence as well as duration. The remaining questions in this section focus on the nature of assistance sought and rendered and the compliance and effectiveness of such treatment(s). The third section, comprising the DIS items relevant to depression, covers symptoms of dysphoric mood, psychophysiological symptoms (e.g., poor appetite, sleep difficulty, loss of energy, agitation or retardation, loss of interest in usual activities, or decrease in sexual drive), certain cognitive features (feelings of self-reproach or guilt, diminished ability to think or concentrate, and recurrent thoughts of death or suicide), and the absence of other psychiatric conditions. The fourth section is equivalent to the DIS questions that concern alcohol abuse and dependence, specifically about the extent to which there is an identifiable pattern of pathological alcohol use (defined in terms of level of social or occupational functioning, quantities consumed, frequency of consumption, amnesic periods, and inability to decrease or cease alcohol consumption). The fifth and last section consists of DIS questions with respect to somatization disorder. The diagnostic criteria include a history of physical symptoms lasting several years that began prior to 30 years of age and a predetermined number of physical complaints, ranging from general sickliness to symptoms of gastrointestinal distress, psychosexual problems, and cardiopulmonary symptoms.

The SADS is a structured diagnostic interview designed for administration by psychiatrists, clinical psychologists, and psychiatric social workers (Endicott and Spitzer 1978). It provides a progression of questions, items, and criteria that systematically rule in or out specific diagnoses according to research diagnostic criteria. The SADS significantly reduces the criterion and information variance that contribute to the unreliability of previous evaluation procedures. There are three versions of the SADS: a regular version (SADS), which addresses a current episode of psychiatric illness and focuses on present functioning (and 2 weeks prior); a lifetime version (SADS-L), which reviews the individual's entire life as well as any current disturbance; and a third version (SADS-C), for measuring change.

SADS-L Interrater Reliability

The SADS-L was selected as the basis for establishing criterion validity in the present study. Since the study required diagnostic assessments by multiple interviewers across different sites, an interrater reliability test of the SADS-L was conducted, involving four research psychiatrists. For the purpose of this interrater reliability test, 20 subjects were drawn from the patient population of a local urban Indian mental health program. Each psychiatrist interviewed five randomly assigned subjects. These interviews were taped, and 10 were chosen subsequently for viewing and rating by the other three psychiatrists.

The degree of agreement among the raters was assessed with the kappa statistic. The kappa coefficients of these comparisons ranged between .94 and .79, generally acknowledged as excellent. In terms of the kappa coefficients of each rater versus the consensus of the majority for each diagnosis, the degree of agreement ranged from good (.62) to excellent (1.0) among the comparisons of rater pairs. The overall kappa coefficients were excellent for major depressive disorder (.89) and alcoholism (1.0).

Study Sites

As previously noted, the study was designed to permit intertribal comparisons of the validity of diagnostic instrumentation for certain psychiatric disorders. Hence, three reservation communities were chosen to represent several of the various major culture areas that characterize the diverse social, religious, political, and linguistic elements of the American Indian life experience. For the purposes of the present discussion, these three communities are referred to as the Pueblo, Plateau, and Plains study sites. This convention has been adopted to avoid stigmatizing the communities in question, which, by virtue of their small size, may be singled out inappropriately as examples of widespread psychiatric problems.

The Pueblo study site is situated in the Southwest and is a relatively small reservation, especially in comparison with its Plateau and Plains counterparts. The Pueblo study site is well above sea level, semiarid, and dominated by large mesas. Over 80 percent of the 10,000 tribal members live on the reservation. A large on-reservation IHS hospital and outpatient clinic provide a wide spectrum of primary and mental health care. Part-time satellite clinics offer limited services to residents living 30 miles or more from the hospital. The tribe occupying this reservation is among the most traditional of Indian communities. It has long resisted social and cultural change, though residents are concerned about the increase of nontribal marriages, off-reservation migration, and the decline in native language ability. Traditional healing is a strong and deeply ingrained practice, as is the ceremonial life of tribal members.

The Plateau study site is located in the Pacific Northwest and encompasses a large tract of land that extends from the foothills of the mountains to the arroyos of a semiarid plateau. Tribal membership numbers approximately 3,800 and comprises several confederated tribes. The health and mental health facilities on the reservation include a wide range of outpatient services. Most of these services are tribally operated, though primary care remains an IHS responsibility. The nearest hospital, to which the IHS physicians and tribal mental health professionals have admitting privileges, is located off the reservation in a small rural town. The tribes living at the Plateau study site have been subjected to a long history of acculturative pressure, but much of the traditional ceremonial life has remained intact and is undergoing active revitalization.

The Plains study site is situated in the northern Midwest and covers a large land mass that consists mainly of high, rolling prairies that are interrupted by numerous rivers, creeks, lakes, buttes, and hills. About 6,200 tribal members and slightly more than half this number of whites live on the reservation. The bulk of the health and mental health services are delivered through an IHS hospital and clinic located in the agency town. As on the Pueblo study site, a series of part-time satellite clinics offer the remainder of the care in outlying areas. The reservation is occupied by a single tribe with several bands. Here, too, social and cultural changes have eroded traditional subsistence patterns, language, and religion. However, indigenous healing practices and such ceremonies as the sun dance quietly continue.

Sample Characteristics

This paper reports findings based upon the SADS-L interviews that were conducted by the research psychiatrists in the course of identifying the CIGs at each study site. A total of 104 such interviews took place between 1982 and 1984, yielding the 86 confirmed cases of major depression that are the subject of this paper.

The three study sites are virtually equally represented, with each accounting for one-third of the cases in question. Females (62.8 percent) outnumber males (37.2 percent), as they generally do in IHS and tribal mental clinic patient populations. However, this pattern breaks down across the study sites. Males are represented more frequently among the Plateau group than among the Pueblo or Plains cases. This difference is attributed to the sampling procedure that, at the Plateau site, drew more heavily on referrals from the local tribal alcohol treatment program. Subjects average 38 years of age. Mean age also varies by sex (males, 33.0 years; females, 40.9 years) and, consequently, by site (Pueblo, 39.4 years; Plateau, 33.7 years; Plains, 40.6 years). Fifty-nine percent of the cases completed 12 or more years of formal education. The amount of formal education varies significantly by sex ($X^2 = 10.5$, df = 4, $p < .05$), with females evidencing fewer years of schooling completed than males. Fifty percent of the subjects are married, 35 percent are either widowed, separated, or divorced, and 15 percent are single. Marital status is distributed similarly across the study sites.

Statistically significant differences obtained in the relative frequency with which feeings of worthlessness ($X^2 = 7.1$, df = 2, $p < .05$), difficulty concentrating ($X^2 = 11.4$, df = 2, $p < .01$), and thoughts of death ($X^2 = 7.8$, df = 2, $p < .05$) are reported by respondents across the study sites. Specifically, these three symptoms are endorsed less frequently among Plateau cases (71 percent, 50 percent, and 68 percent, respectively) than among either Pueblo (86 percent, 72 percent, and 84 percent, respectively) or Plains (97 percent, 90 percent, and 93 percent, respectively) cases. Neither these nor any other depressive symptoms vary markedly by sex.

Other psychiatric disorders often co-occured with major depression in the present sample. Half of the subjects met criteria for alcoholism. Significant numbers also were diagnosed as suffering from generalized anxiety (19.8 percent), intermittent depression (18.6 percent), drug use (17.4 percent), and phobia (17.4 percent). Diagnoses of generalized anxiety ($p < .05$), phobia ($p < .001$), and cyclothymic personality were ($p < .01$) obtained significantly more frequently among females than males. Conversely, males accounted for disproportionately larger percentages of the diagnosed cases of alcoholism ($p < .001$) and drug use ($p < .05$). As one might expect, based on the difference between the sexes in the co-occurrence of alcoholism with depression, far fewer males (22 percent) than females (78 percent) were diagnosed as having experienced primary depression ($X^2 = 10.3$, df = 1, $p < .01$).

Shore and colleagues (manuscript in preparation) discuss the pattern of depressive symptoms across this sample in much greater detail. Moreover, they also consider the phenomena of "double" as well as "complicated" depression at considerable length, pointing out implications for diagnosis and treatment in this special population.

Findings

Three sets of findings are relevant to the relationship between alcoholism and depression in this sample: (1) the profile of SADS-L alcohol symptoms across the entire sample of confirmed cases of major depression, (2) the profile of SADS-L alcohol symptoms within the concurrent cases of alcoholism and depression, and (3) sociodemographic variations correlated with both SADS-L alcohol symptoms and SADS-L depressive symptoms.

Table 1 depicts the frequency with which symptomptoms of alcoholism were reported by the entire

Table 1.—SADS-L alcohol symptom profile for clinic index group confirmed for major depression and for alcoholic cases within clinic index group

	Clinic index group		Alcoholic cases within clinic index group	
Symptom	N	Percent	N	Percent
Drank too much	59	69	42	98
Others objected	56	65	37	86
Difficulty with family	46	54	38	88
Traffic difficulties	40	47	33	77
Blackouts	40	47	33	77
Missed work	39	45	33	77
Physically violent	36	42	28	65
Gone on benders	32	37	28	65
Tremors	32	37	29	67
Couldn't stop drinking	31	36	28	65
Drank before breakfast	31	36	28	65
Picked up by police	31	36	26	61
Lost job	21	24	18	42
Divorced/separated	21	24	17	40
Hallucinations	16	19	16	37
Delirium tremens	12	14	12	28
Physical complications	12	14	11	26
Seizures	3	4	3	7
Current problem	22	26	22	51
Total N	86		43	

sample and by known alcoholic cases within the sample. More than two-thirds of the entire sample indicated that they believed they drank too much. A slightly smaller number noted as well that others objected to their drinking. More than half of the subjects acknowledged having difficulty with their families as a consequence of excessive drinking. Absenteeism from work and lost jobs due to drinking were common. One-third to one-half of the sample described themselves as unable to stop drinking, as needing a drink before breakfast, as engaging in frequent "benders," and as suffering blackouts when drinking heavily. Physical violence, traffic violations, and police encounters were frequent. Seventy percent of the sample reported two or more of these symptoms during the same period of time. Half of the sample reported heavy drinking in the past month and met the criteria for alcoholism; one-quarter was found to have a current drinking problem. As expected, SADS-L alcoholism symptoms were endorsed more frequently by the known cases of alcoholism in the sample than by the overall sample. Significant differences are found between the cases and noncases of alcoholism in terms of the frequency of symptom endorsement, the minimum number of symptoms, and reports of heavy drinking during the month prior to the interview.

The frequency of alcoholism symptom endorsement among the known cases of alcoholism is summarized in table 2 by subject sex and in table 3 by study site. Few significant differences are evident. Males reported missing work more often and having lost their jobs more frequently than females. Traffic difficulties varied significantly across study sites. Though these differences can be explained in terms of the social ecologies of the study sites, it is equally probable that they may be due to chance.

Lastly, the number of SADS-L symptoms of alcoholism and of depression among the concurrent cases, i.e., alcoholic cases confirmed for major depression, were analyzed in terms of sociodemographic variables. Neither the number of alcohol symptoms nor the

Table 2.—SADS-L alcohol symptom profile for alcoholic cases within clinic index group confirmed for major depression by sex

Symptom	Male		Female	
	N	Percent	N	Percent
Drank too much	23	96	19	100
Others objected	23	96	14	82
Difficulty with family	23	96	15	79
Traffic difficulties	21	88	12	63
Blackouts	19	79	14	74
Missed work[a]	22	92	11	58
Physically violent	19	79	9	47
Gone on benders	16	67	12	63
Tremors	15	63	14	74
Couldn't stop drinking	16	70	12	67
Drank before breakfast	16	70	12	63
Picked up by police	15	65	11	58
Lost job	12	52	6	32
Divorced/separated[b]	14	61	3	17
Hallucinations	7	29	9	47
Delirium tremens	5	21	7	27
Physical complications	8	33	3	17
Seizures	2	8	1	6
Current problem	14	64	8	53
Total N	24		19	

[a] $X^2, p < .05$.

[b] $X^2, p < .01$.

number of depression symptoms is strongly associated with age. The number of alcohol symptoms differs significantly by educational level (p < .05); however, this finding is rendered meaningless by the small sample sizes in several of the cells. The number of depressive symptoms does not vary by amount of formal education. There is a trend for males to report more symptoms of alcoholism than females (12.5 versus 10.6). Males and females endorse similar numbers of depressive symptoms (6.3 versus 6.9). The number of alcoholism symptoms does not vary significantly as a function of either marital status or study site. While there is no significant difference in the number of depressive symptoms across marital status, Plains subjects reported a significantly greater number of depressive symptoms than their counterparts at the other two sites (7.8 for Plains, 6.8 for Pueblo, and 6.0 for Plateau, p < .01). Finally, a correlational analysis revealed little systematic covariation between symptoms of alcoholism and symptoms of depression (r = .09).

Discussion

The significance of the findings reported in this paper touches upon a wide range of substantive as well as theoretical concerns. Turning first to instrumentation, the present study clearly demonstrates that standardized psychiatric interviews—specifically the SADS-L—can be administered reliably among American Indians. Indeed, interrater agreement was perfect with respect to the diagnosis of alcoholism and ranged from good to excellent on other disorders. This effort represents the first systematic examination of such diagnostic protocols applied to members of this special population. The results indicate that the SADS-L constitutes a reasonable psychiatric measure of caseness that can be employed in conjunction with other multidimensional inventories of alcohol use to develop more clinically meaningful interpretations of the latter.

The data reported here illustrate the nature and

Table 3.–SADS-L alcohol symptom profile for alcoholic cases within clinic index group confirmed for major depression by field site

	Pueblo		Plateau		Plains	
Symptom	N	Percent	N	Percent	N	Percent
Drank too much	12	100	22	96	8	100
Others objected	12	100	20	87	7	88
Difficulty with family	11	92	20	87	7	88
Traffic difficulties[a]	8	67	21	91	4	50
Blackouts	10	83	16	70	7	88
Missed work	10	83	18	78	5	63
Physically violent	7	58	15	65	6	75
Gone on benders	9	75	13	57	6	75
Tremors	6	50	15	65	8	100
Couldn't stop drinking	6	55	17	77	5	63
Drank before breakfast	6	55	17	74	5	63
Picked up by police	9	82	12	52	5	63
Lost job	3	27	13	57	2	25
Divorced/separated	5	50	10	44	2	25
Hallucinations	7	58	5	22	4	50
Delirium tremens	5	42	4	17	3	38
Physical complications	2	18	8	35	1	13
Seizures	1	9	2	9	0	0
Current problem	5	46	14	74	3	43
Total N	12		23		8	

[a] $\chi^2, p < .05$.

extent of coexisting disorders, namely major depression, among American Indians suffering from alcoholism. This is particularly true for males. In the present study, no diagnosis of major depression was made with alcoholism unless there was at least a 3-month period of sobriety prior to the onset of a readily distinguishable depressive episode. The period of sobriety among the depressed males with a history of alcoholism ranged from 3 to 48 months. This high rate of alcoholic history with subsequent depression highlights the close association of these two disorders and renders the distinction of secondary depression a particularly important diagnostic problem. Shore and colleagues (manuscript in preparation) discuss a "triad" of depressive syndromes, consisting of major depression, alcoholism with secondary depression, and "complicated" depression (major depressive disorder superimposed on an underlying chronic depression or personality disorder). Each presents in subtly different ways that may imply distinctive courses and prognoses.

As one would expect, the cases of alcoholism in this sample endorsed the SADS-L alcoholism symptoms significantly more frequently than the nonalcohol cases. Yet, certain symptoms also are common to the latter. Nearly 30 percent of the nonalcohol cases reported that there had been a period in their lives when they drank too much; slightly more than one-third revealed that others had objected to their drinking. This pattern emphasizes a tendency for both groups to drink episodically, just short of dependence. This finding reinforces the conclusions of Levy and Kunitz (1974) that the high prevalence of episodic binge drinking among American Indians does not necessarily equate with a diagnosis of alcohol dependence.

Perhaps the most surprising result of these findings discussed above is the virtual lack of differences in the alcoholism symptom profiles by subject sex. Clinical lore typically holds that alcoholic Indian females differ from their male counterparts. Males are said to often exhibit significantly greater antisocial behavior. Females are believed to have greater difficulty with their family, friends, or acquaintances and to have far fewer traumatic physical consequences of drinking, such as blackouts and tremors. The similarity in alcoholism symptom profiles across male and female cases may reflect the degree of impairment and extensive drinking histories common to alcohol-dependent individuals. Past assertions about gender differences in this regard may reflect difficulties in comparison inherent in noncase-oriented procedures.

This study reports the first crosstribal comparisons of alcoholism symptom profiles. Here, too, the similarities are remarkable, particularly given the cultural diversity of the sites in question. Again, the degree of impairment and extensive drinking histories common to alcohol-dependent individuals may override cultural differences in the symptoms queried for diagnostic purposes.

Lastly, the number of symptoms of alcoholism and depression among the alcoholic cases revealed little in the way of meaningful patterns. It is interesting to note that the alcoholism and depression symptoms are not strongly correlated, thus providing some empirical evidence for their operation as distinct constructs within this population, at least in terms of the diagnostic criteria employed to elicit the constituent features.

Future reports of this study will build upon the findings of this particular phase. The next logical step is to examine the concordance of SADS-L and DIS diagnoses as well as symptoms. A related task involves assessing the validity of the latter technique by comparing diagnostic data for the clinic index groups with those of the matched community groups. Finally, and just as important, the explanatory models that the tribes hold for organizing this specific set of experiences will be brought to bear on the diagnostic information at hand, offering a rare look at the relationships between them.

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American Indian Alcohol Misuse and Treatment Outcome

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ABSTRACT

American Indian alcoholism treatment outcome has been infrequently reported in the scientific literature. A recent study of selected alcohol treatment programs found that only 8 percent performed any evaluation of treatment effectiveness in 1983. The American Indian Research group in Seattle examined the treatment use, treatment outcome, and recidivism for several urban American Indian samples drawn from detoxification, inpatient halfway house, and outpatient alcoholism treatment settings. Further, a sample of outpatients at a primary medical health care clinic for American Indians was followed to assess alcohol use problems in this population. Longitudinal data were collected for demographic, alochol-related historical/environmental, and treatment outcome variables. Recidivism data were provided through the Washington State Alcoholism Monitoring Systems (WSMAS), which documented all admissions to State-funded alcoholism treatment programs. Preliminary findings indicate a high prevalence of alcohol-related problems for Northwest urban American Indians. Chronicity and recidivism affected patients within all treatment samples. Successful outcome was infrequent, despite extensive time in treatment for most subjects. Finally, the rate of alcohol dependence and alcohol abuse was 43 percent for the medical health clinic sample at first contact and 54 percent at 1-year followup. These findings emphasize the need for further investigations of issues that may be related to the recovery process and protective factors that may prevent alcoholism in members of this high-risk group.

Introduction

Numerous indices of morbidity and mortality document the high risk among American Indians for alcohol-related problems. For instance, recent Indian Health Service (IHS) data suggested that 4 of the top 10 causes of death among American Indians were attributable in large part to alcohol abuse–namely accidents, cirrhosis, suicides, and homicides (U.S. Department of Health and Human Services [DHHS] 1984; Raymond and Raymond 1984). IHS also reported that during 1981, hospital discharge rates for Indian males and females with alcohol-related diagnoses were three times higher than for the United States as a whole and twice the rates for other non-Caucasians. These problems appeared especially prevalent in the 15-44 year age group, for which the rate of alcohol-related discharge diagnoses was four times that of the same age group nationally. Hospital discharge rates by alcohol-related diagnostic category (i.e., alcoholic psychosis, alcohol dependence, alcohol abuse, and liver disease) remained significantly higher than the rates for the general population (DHHS 1984; Walker et al., in press). Given these facts, it is clear that alcohol misuse continues to be a severe problem among American Indians.

Treatment of alcohol-related problems among American Indians has been much less thoroughly investigated. The limited knowledge about treatment outcome in this population can be traced in part to inadequate theoretical foundations. Wallace (1978, p. 43) identifies some prerequisites for such theories: "Theories of treatment should proceed from a clear understanding of the nature of the alcoholic client, his characteristics, the dilemmas he faces, and the choices he has to make." Besides weak theoretical foundations, treatment outcome research among American Indians has been hampered by methodological problems particular to the study of this population. Furthermore, many of the same obstacles to valid treatment outcome research that have arisen in studies of other groups of alcoholics apply as well to American Indian alcoholism research. This paper addresses the conceptual and methodological issues raised in the current research and makes suggestions for future investigations. Implications are also discussed for future development of more effective treatment interventions for American Indians and Alaskan Natives with alcohol-related problems.

Treatment Outcome

Literature Review

Before addressing treatment outcome findings for American Indian alcoholics, it is important to look at what is known from the literature on other alcoholic populations. Internationally, the predominant approach to treatment has been tertiary care (rehabilitation) for the chronic alcohol abuser. In a comparative study of alcohol treatment programs in Poland, Finland, Switzerland, The Netherlands, Ireland, Canada, and the United States, Single (1984) found that rapid expansion of alcohol treatment services occurred during the late 1960s and early 1970s. In reviewing these programs, Single (1984, p. 251) concluded that "common solutions were adopted for different problems," with expansion of similar treatment services despite sharp differences in community conceptions about alcohol problems.

In the United States, it was estimated that alcohol treatment in 1980 cost $4.5 billion, with an additional $5 billion being spent on alcohol-related illnesses (Miller and Hester 1987). Most of these treatment dollars were spent on inpatient treatment programs (Knowles 1983). In contrast to outpatient treatment, inpatient treatment was found to be more extensive and more expensive. It has also been assumed to be more effective. However, Miller and Hester recently reviewed controlled studies of treatment outcome and reached the following conclusions:

1. Outpatient treatment, without exception, was consistently no less effective than inpatient treatment.
2. No difference in treatment outcome occurred when longer or shorter inpatient stays were compared, even when extended inpatient care was compared to detoxification alone.
3. Posttreatment life circumstances and outpatient aftercare accounted for more of the variance in outcome than the nature or amount of inpatient treatment.
4. Successful outcome may be produced by far less costly alternatives than inpatient treatment, except for acute cases such as severe withdrawal, physical violence within the family, or acute suicide risk.

In their review, Miller and Hester failed to compare programs that provided different forms of treatment or that served different types of clients. For instance, it is possible that such findings would not apply to American Indians. Indeed, current treatment practices assume that different treatment programs should be implemented for American Indians (Westermeyer 1982).

Very few researchers have examined American Indian alcohol treatment programs. Earlier reports of treatment outcome for Indians were limited to studies with the Chippewa (Westermeyer and Neider 1984), the Navaho (Ferguson 1970), and the Makah (Shore and Von Fumetti 1972). All treatment within these studies took place more than a decade ago, and none of the 177 programs currently funded by IHS was included. The results of the studies indicated that successful treatment outcome remains elusive. Raymond and Raymond's (1984) assessment of IHS alcohol treatment programs indicated that only 8 percent of those programs funded by IHS evaluated treatment outcome during 1983.

These IHS treatment programs exist on reservations and in rural and urban areas. The programs are established and supported locally and use a wide array of treatment approaches. Most programs have integrated selected portions of the precepts and principles of Alcoholics Anonymous along with traditional religion and activities to increase Indian identification and to promote self-image. Without an assessment or evaluation of the outcomes of specific types of programs, however, the probability of providing effective treatment that will address specific patient needs is reduced. Perhaps the issues raised by Miller and Hester do not apply to the treatment of American Indians: Intensive inpatient treatment may be more effective than outpatient treatment, longer inpatient stays may lead to better outcome than shorter inpatient stays, and life circumstances may be surmounted by treatment.

Based on previous treatment outcome findings, our research began with a series of preliminary studies to answer the following questions: What multidimensional criteria can be used to assess "successful" treatment outcome from the perspectives of the patient, treatment staff, and urban American Indian community standards or, in other words, how do we define success? Do any programs produce successful treatment outcomes for American Indians? What types of treatment work best for what types of patients (e.g., urban versus rural, young versus old, male versus female, Indian-oriented versus integrated) with what types of problems (e.g., abuse versus chronic alcohol dependence)? What factors besides the type and amount of treatment and posttreatment services–for example, life circumstances–contribute to treatment outcome for American Indians?

Seattle Treatment Outcome Project

Beginning in 1980, six volunteer samples of American Indian and Alaskan Native male and female patients have been followed as part of the Seattle Treatment Outcome Project. The sample represents 39 tribes and 10 cultural groups and includes patients from detoxification, inpatient, halfway house, and outpatient alcoholism treatment settings, along with a sample of outpatients at an urban Indian primary health care clinic. On the basis of a longitudinal prospective approach to understanding Indian response to alcoholism treatment, our objectives were (1) to follow 50 detoxification patients who abused alcohol but rejected further treatment, (2) to follow 90 patients who were treated for alcoholism in either an inpatient or halfway house program for American Indians, (3) to compare response to treatment outcome between 46 patients from an Indian-oriented inpatient program with 27 Indian clients of an integrated (i.e., ethnically and culturally diverse) treatment program, (4) to follow 150 ambulatory medical patients from the Seattle Indian Health Board, and (5) to determine retrospectively what characteristics are associated with recovery after treatment by interviewing American Indian and Alaskan Native alcoholics who had at least 1 year of sobriety.

Data for all samples were collected through a closed-end interview that included the use of several well-known alcohol data-collection instruments (e.g., Alcohol Use Inventory, Michigan Alcoholism Screening Test [MAST], Beck Depression Inventory). This interview provided information about demographic variables, alcohol-related historical/environmental variables, and treatment outcome variables. Recidivism was established by an independent method using information from the Washington State Alcoholism Monitoring System (WSAMS). Since the State of Washington implemented the Uniform Alcoholism and Intoxication Treatment Act in 1975, all admissions to alcoholism treatment programs receiving State funding are registered with WSAMS. Finally, all samples have been followed over time, which resulted in an average followup rate of 80 percent for all samples.

Results

The Detoxification Sample

Fifty urban American Indians were initially interviewed during admission to a freestanding medical detoxification unit. Table 1 summarizes the results from the year prior to the initial interview through 2 years of followup. This sample averaged 44.6 total documented admissions to detoxification units. Members of the sample group also spent an average 64.1 total days in other inpatient treatment settings, excluding detoxification, with no significant change in average number of annual detoxification admissions. All but 3 of the 44 subjects, who were followed for 2 years, reported recent alcohol dependence symptoms or episodic alcohol abuse. Three patients reported abstinence for at least the 6 months prior to the followup interview. However, all three had at least one documented detoxification admission during the second year of followup. These urban American Indians continued to experience serious alcohol-related problems, despite repeated treatment in medical detoxification, inpatient, and halfway house rehabilitation settings.

Table 1.—Detoxification admissions and inpatient treatment days over 3 years

	Year 0	Year 1	Year 2	Total	F
Detoxification admissions					
Mean	12.7	15.7	15.2	44.6	2.07
(S.D.)	(12.2)	(15.8)	(19.4)	(44.1)	
Range	0-47	0-55	0-76	0-171	
Percent with one or more admissions	82	82	74	90	
Inpatient days					
Mean	27.1	19.8	17.2	64.1	1.11
(S.D.)	(60.0)	(35.8)	(35.3)	(106.8)	
Range	0-291	0-160	0-126	0-445	
Percent with one or more admissions	34	34	26		

Note: Year 0 = 12 months prior to initial interview; year 1 = months 1-12 of followup; year 2 = months 13-24 of followup.

These findings, when combined with the results for residential treatment, bear out Miller and Hestler's conclusions that little difference in treatment outcome exists for residential programs, regardless of whether they are detoxification, inpatient, or halfway house programs. Our findings for this chronic and poor-prognosis sample of urban American Indians suggest little evidence of successful treatment outcome, regardless of the type or amount of treatment.

The Inpatient and Halfway House Samples

The Cedar Hills Alcohol Treatment (CHAT) program was an Indian-specific inpatient treatment facility in the Seattle area that existed until December 31, 1980. The program was subsequently integrated into the other Cedar Hills programs. Fortunately, the desired sample size was obtained before closure, but staff shortages and morale were a problem during that time. The Thunderbird Halfway House (TBIRD) is the only halfway house treatment program for American Indians and Alaskan Natives in Seattle. In comparing inpatient samples with halfway house samples, no meaningful patient differences were found between the two programs in terms of demographic characteristics, alcohol-related history, or prior treatment use, as illustrated in tables 2, 3, and 4, respectively.

Seventy-three percent of the CHAT patients and 80 percent of the TBIRD patients were followed over a 26-month period. During that period, TBIRD patients had acquired significantly more patient days and patient hours when compared with CHAT patients. However, there were similarities in treatment outcome between the two programs. About half the clients from both programs returned for residential treatment in either another detoxification, inpatient, or halfway house program. Furthermore, 91 percent of the CHAT and 84 percent of the TBIRD patients reported continued alcohol abuse or dependence.

It appears that the efficacy of both types of residential treatment programs remained minimal although this may have been due to the life circumstances of the patients rather than to inadequacies in the programs. Further analyses will clarify the influence of life circumstances on treatment program effectiveness. From the demographics, however, it is apparent that patients tend to be impoverished, highly mobile, unemployed, and disconnected from family support systems. This remains the profile of patients with the poorest prognosis from other alcoholism treatment outcome studies (Annis and Liban 1979). It also remains possible that restricted access to other social welfare programs or the effects of Federal and State budget cuts contributed to these results.

Indian-specific Versus Integrated Treatment Programs

Our preliminary results indicated that no signifi-

Table 2.—Demographics of the Cedar Hills Alcohol Treatment (CHAT) and Thunderbird Halfway House (TBIRD) samples

Demographic characteristic	CHAT Mean (S.D.)	CHAT Percent	TBIRD Mean (S.D.)	TBIRD Percent	*t*	χ^2
Age	33.5 (9.5)		29.5 (7.8)		2.16*	
Indian blood quantum (1=full, 9=≤1/8)	3.4 (2.4)		3.4 (2.4)		.1	
Male		77.3		87.0		.86
Attended government boarding school		27.9		38.6		.70
Had some high school education		81.8		84.8		.29
Single		40.9		52.2		1.26
Lived in Seattle 1 year or less		44.7		43.5		0
Income ≤$5,000 before treatment		67.4		71.1		.02
Had non-alcohol-related arrests		29.5		45.7		1.84
Has been in jail		86.4		84.8		0
N		(44)		(46)		

*$p < .01$.

Table 3.—Alcohol-related history of the Cedar Hills Alcohol Treatment (CHAT) and Thunderbird Halfway House (TBIRD) samples

Alcohol history measure	CHAT (percent)	TBIRD (percent)	χ^2
Adults in family drank a lot	51.2	37.8	2.05
Family history of alcohol problems	70.5	73.9	.02
Lost friends due to drinking	69.8	86.0	2.43
Neglected family obligations due to drinking	62.8	65.1	0
Had alcohol-related arrests	86.4	82.6	0
Had been in detoxification	56.8	58.7	0
N	(44)	(46)	

Table 4.—Prior treatment use for the Cedar Hills Alcohol Treatment and Thunderbird Halfway House (TBIRD) samples

Prior treatment measure	CHAT Mean (S.D.)	CHAT Percent	TBIRD Mean (S.D.)	TBIRD Percent	t	χ^2
Patient days, index agency	50.5 (28.0)		61.7 (34.6)		-1.68*	
Prior help for alcohol abuse	3.3 (2.3)		3.6 (2.2)		-0.51	
Has gone to anyone for help with drinking		55.8		72.1		1.82
Has been hospitalized due to drinking		51.2		55.8		.05
Has been in SIAP previously		47.7		39.1		.37
Has been in prior alcohol treatment program		77.3		78.3		0
Had any outpatient hours in prior year		77.3		93.5		3.56*
Had any recovery days in prior year, excluding index		27.3		17.4		.76
Had any inpatient days in prior year, excluding index		18.2		13.0		.14
Had any detoxification admissions in prior year		50.5		39.1		.68
N		(44)		(46)		

*$p < .05$.

cant differences existed between the CHAT Indian-specific and the CHAT integrated treatment programs for any of the demographic variables, alcohol-related historical variables, treatment use variables, or treatment outcome variables. These findings suggested that, at least for chronic Indian alcohol abusers, an Indian-specific inpatient program produced no more effective treatment than an integrated inpatient program. However, access to treatment–as shown by a reduction in the number of Indians who came into the integrated program–was significantly reduced.

Seattle Indian Health Board

The high rates of relapse and recidivism found in our treatment samples indicated that factors related to abstinence or nonproblematic use of alcohol for American Indians should be investigated. Therefore, 150 ambulatory medical patients at the Seattle Indian Health Board were evaluated to identify potential critical transitions and protective factors affecting alcohol use and treatment outcome for American Indians. The assessment focused on characteristics associated with a patient's drinking status and the development of a retrospective analysis of treatment use and response to treatment within the sample. Other than age, no significant demographic differences were found between drinkers and abstainers, as shown in table 5.

Family history of alcohol problems is examined in table 6. Males with dependence symptoms were much more likely to have experienced an alcohol-related

Table 5.–Demographic characteristics of State Indian Health Board sample at initial interview

Demographic characteristic	Drinkers		Abstainers	
	Mean (S.D.)	Percent	Mean (S.D.)	Percent
Age	34.7 (12.6)		43.2[a] (14.7)	
Age alcohol became problem (N=80)	22.3		N/A	
Score on alcohol dependence scale[b] (N=105)	11.5		N/A	
Male		47.9		36.7
Marital status				
Single		31.4		10.0
Married/common law		33.1		43.3
Divorced/separated/widowed		35.5		46.7
Indian blood quantum[c]				
Full blood		42.1		46.7
Half or more		36.4		33.3
Less than half		21.5		20.0
Lived 1 year or more in Seattle		85.1		93.3
History of alcohol problem in either parent		58.7		53.3
N		(120)		(30)

[a] $t(148) = 2.98$; $p < .01$.

[b] From Alcohol Use Inventory (Skinner and Allen 1982).

[c] Number of tribes represented = 39.

Table 6.–Alcohol use pattern by sex and family history of alcohol problems, in percent

Family alcohol history	Alcohol use pattern			
	Nonproblem	Non-dependent abuse	Dependence symptom	χ^2
Alcohol-related death in first degree relative				
Male	5.3	21.7	43.8	7.41*
Female	16.1	15.4	38.9	n.s.
Heavy drinking style (father)				
Male	31.6	34.8	37.5	n.s.
Female	38.7	38.5	66.7	n.s.
Heavy drinking style (mother)				
Male	47.4	43.5	25.0	n.s.
Female	22.6	23.1	55.6	6.30*

*$p < .05$.

n.s. = not significant.

death in a first degree relative. In addition, women with dependence symptoms were much more likely to have had mothers with a heavy-drinking style. Otherwise, family history of alcohol problems was uniformly high, with no difference among nonproblem drinkers, alcohol abusers, and alcohol-dependent subjects.

The alcohol use variable indicated that 76 percent of this sample had experienced alcohol abuse symptoms and 70 percent had suffered symptoms of alcohol dependence at some point in their lifetimes. Combining abstainers with those who were assessed as nonproblem drinkers provided sufficient statistical power to continue our analysis of alcohol use patterns. Table 7 illustrates the three groups under study by gender and type of child-rearing background (i.e., reservation versus boarding school).

It was hypothesized that current drinking status would be related to whether or not the patient grew up on the reservation or attended boarding school. Table 7 shows two significant relationships: Females who grew up on the reservations appeared more likely to remain nonproblem drinkers, and males who attended boarding school were more likely to suffer from dependence symptoms. Alcohol dependence symptoms were defined as any occurrence of one or more of the following behaviors in the past month: blackouts, shakes, morning drinking, passing out, missed meals due to drinking, or steady drinking for 12 or more hours. However, growing up on a reservation failed to influence men, and attending boarding school failed to influence women.

Changes in drinking status at the 1-year followup were disappointing, as shown in table 8. Twenty-six percent of the abstinent and nonproblem drinkers either abused alcohol or became alcohol dependent, while very few of those who abused alcohol or who exhibited dependent symptoms changed their drinking status.

In comparison with the samples discussed earlier, alcohol treatment recidivism and abuse/dependence problems continued for many urban American Indians, including those who were not involved in treatment programs. Table 9 illustrates these findings across the three modalities of treatment programs and the one primary health care clinic.

In summary, our preliminary analyses of treatment outcome data for clinical samples of urban American Indian alcoholics in the Northwest suggested that most patients acquired a record of multiple admissions to a variety of treatment facilities and programs. Recidivism was the rule and successful outcome the exception. These findings were consistent with those extrapolated from the Raymond and Raymond (1984) report: The focus of treatment appeared to be fixed on the chronic user, primarily in residential treatment.

The Recovered Alcoholic Sample

In order to investigate the recovery process, further data are being compiled on a sample of recovering Indian alcoholics. Preliminary results suggest that these subjects tend to be younger, more educated, more stably employed, and more involved with a family and social support system. Lifetime drinking history appears to have involved fewer drinking phases, less alcohol consumed in each phase, and shorter treatment histories. Further analysis will focus on critical transitions that prompt the decisions to maintain sobriety and protective factors to prevent recidivism.

Discussion

It appears that most of the subjects in the study were chronic alcoholics who remained within the treatment system as recidivists. A smaller number of the subjects in our samples were first-timers in the alcohol treatment system; yet these patients appeared quite similar, demographically, to the recidivists. Even among a primary health care sample of American Indians, alarming rates of alcoholism treatment use occurred among subjects who appeared to be quite similar to the treatment samples. One implication of this finding is that alcohol abuse possibly has become a means of securing social support in a larger system in which other social supports are not readily accessible. Future research can attempt to document this possible association.

Certainly, few favorable treatment outcomes can be expected from a treatment system in which the majority of clients are severely impaired, chronic alcoholics. However, notwithstanding the severity of alcohol-related impairment among these populations, high relapse rates would seem to warrant closer examination of the treatment system as well. Typically, the primarily custodial alcoholic treatment system, with its shortages of adequately trained staff, unsystematic assessment procedures, and unspecified treatment interventions, failed to prevent relapse.

Table 7.–Alcohol use pattern by sex and child-rearing background, in percent

Sex/background	Alcohol use pattern Nonproblem	 Non-dependent abuse	 Dependence symptom	 χ^2
Male				
Grew up on reservation	21.1	43.5	46.7	n.s.
Attended boarding school	5.3	8.7	50.0	13.93**
All males	32.8	39.7	27.6	–
N	(19)	(23)	(16)	
Female				
Grew up on reservation	54.8	15.4	27.8	7.29*
Attended boarding school	25.8	7.7	27.8	n.s.
All females	50.0	21.0	29.0	–
N	(31)	(13)	(18)	
Overall	41.7	30.0	28.3	–
N	(50)	(36)	(34)	

*$p < .05$.

**$p < .001$.

n.s. = not significant.

Table 8.–Percent change in drinking status at 1 year followup

Initial drinking status	Number of persons with drinking status at 1-year followup Abstainers	 Non-problem	 Abuse	 Dependence	Total	Percent
Abstinent	20	4	1	1	26	21.5
Nonproblem	4	23	6	10	43	35.5
Alcohol abuse	3		13	11	27	22.3
Alcohol dependence	1	1	9	14	25	20.7
Total	28	28	29	36	121	
Percent	23.1	23.1	24	29.8		100

Table 9.—Alcohol treatment recidivism and problems among urban American Indians at followup, in percent

Site of initial interview	Residential treatment[a]		Alcohol abuse dependence[b]	
	At 1 year	At 2 years	At 1 year	At 2 years
Detoxification	–	82.0	–	93.2 (41/44)
Inpatient (N=44)	–	47.7	–	90.6 (29/32)
Halfway house (N=46)	–	45.7	–	83.8 (31/37)
Health clinic (N=150)	12.7	–	53.8 (59/121)	–

[a]Residential treatment includes any admission to detoxification, inpatient, or halfway house programs during the followup interval, as documented in the Washington State Alcoholism Monitoring System data base.

[b]Followup rates (based on interview and/or agency records) were 88 percent for detoxification, 72.7 percent for inpatient treatment, 80.4 percent for halfway house, and 80.7 percent for health clinic.

Recommendations for Future Research

Alcohol misuse continues to be the single most important and visible problem in American Indian communities. The time has come for a broadly based national demonstration research project that would develop a systematic approach to studying and treating alcohol problems. Such research and treatment should establish direct applicability mof efforts into the Indian community, be it urban or reservation. Collaboration for these research activities among investigators in NIAAA and IHS is essential. Staff training directed toward effective assessment, early identification, and recidivism prevention, should be an essential part of Indian alcoholism treatment programs and should be developed on a national level.

Future research on American Indians should include the following:

Epidemlology: Study access to care (social, medical, economic); effect of Federal policy; psychosocial factors; natural history of alcoholism; male, female, and family uses of alcohol.

Assessment: Study self-identification process; define terms and tests; identify community norms and coexisting disorders.

Diagnosis: Determine psychological, biological, and social issues.

Treatment: Define success and track successful patients; develop patient typology; study posttreatment environment, recidivism, violence, disulfiram therapy, and cost-effectiveness.

Prevention: Conduct screening and early intervention; identify factors that protect high-risk individuals and families; determine effects of chronic illness on the individual, family, and community.

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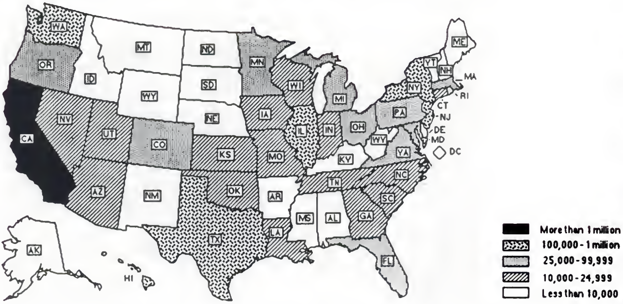
IV.

Alcohol Use Among Asian/ Pacific Americans

The Asian and Pacific Islander Population: 1980



Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1986* (106th edition) Washington, D.C., 1985.

Selected Social and Economic Characteristics of the Asian and Pacific Islander Population: 1980

	Total	Percent
Population	3,726,000	100.0
Under 15 years old	945,000	25.4
15-44 years old	1,976,000	53.0
45-64 years old	584,000	15.7
65 years old and over	222,000	5.9
Years of school completed		
Persons 25 years old and over	2,137,000	100.0
Elementary: 0-8 years	351,000	16.4
High school: 1-3 years	187,000	8.8
4 years or more	527,000	24.7
College: 1-3 years	368,000	17.2
4 years or more	704,000	32.9
Labor force status		
Civilians 16 years old and over	2,722,000	100.0
In civilian labor force	1,773,000	65.1
Employed	1,689,000	62.1
Unemployed	84,000	3.1
Unemployment rate*	—	4.7
Total families	818,000	100.0
Married couples	691,000	84.4
Female householders†	88,000	10.8
Male householders†	39,000	4.8
Median family income, 1979	$22,713	na‡
Persons below poverty level, 1979	476,000	13.1

Source: U.S. Bureau of the Census, *Statistical Abstract of the United States: 1985* (105th edition) Washington, D.C., 1984.

* Total unemployment as percent of civilian labor force. † With no spouse present. ‡ not applicable

Alcohol Use and Abuse Among Four Ethnic Groups in Hawaii: Native Hawaiians, Japanese, Filipinos, and Caucasians

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ABSTRACT

The State of Hawaii has a diverse ethnic composition among its population, including substantial numbers of Native Hawaiians, Japanese, Filipinos, Chinese, and Caucasians, as well as smaller numbers of Koreans, Samoans, Portuguese, and persons of mixed ancestry. In Hawaii, the existence of ethnocultural and socioeconomic diversity, coupled with a relatively high incidence of alcohol consumption, provides a favorable environment for conducting alcohol research, especially as it relates to different ethnic groups.

In this paper, cultural differences in Hawaii are discussed from two standpoints. First, demographic data from Federal and State sources are presented that document and underscore the unique ethnic mix in the Hawaiian Islands. The dynamic nature of Hawaii's ethnic makeup–as evidenced by the continuous influx of immigrants from foreign countries, the inmigration of Caucasians from the U.S. mainland, and the transitory presence of tourists and military personnel–adds to the complex cultural configuration in the State. This diversity raises a host of methodological and analytical issues that must be addressed when designing and conducting alcohol studies in Hawaii and when interpreting the results.

Second, the paper reviews published and unpublished reports on alcoholism in Hawaii from 1964 to 1984. The research indicates that there is great variability in estimates of the prevalence of alcohol users, abusers, and alcoholics across ethnic groups. Nonetheless, in terms of the current use of alcohol, the accumulated evidence seems to indicate that Caucasians and Native Hawaiians do not differ significantly from each other but that these two groups differ significantly from the Japanese, Chinese, and Filipinos. In most estimates of drinking prevalence and alcohol abuse, the Chinese and Filipinos rank lowest. These studies also show that females use alcohol far less than males do and that these sex differences hold true across the various ethnic groups. Recommendations are made and opportunities identified for further alcohol research in Hawaii.

Introduction

The objectives of this paper are threefold. First, the current demographic makeup of the State of Hawaii is described, characterizing its racial and cultural diversity. Some of the forces–past and present–that contribute to the changing nature of the population of Hawaii are also discussed. In this first section, several issues concerning definitions of ethnicity and estimates of the size of various ethnic groups in Hawaii are mentioned. This background provides a context for evaluating the data that are reviewed here and presented in other papers in this volume which discuss alcohol use and abuse in Hawaii. It also should emphasize the value of, and opportunities for, future epidemiological research in Hawaii.

The second objective is to review published and unpublished reports on alcohol use and abuse in Hawaii, again focusing on those that provide data on ethnic variation in alcohol-related behaviors. This part of the paper is limited to indices of consumption and alcohol abuse, primarily among the four largest ethnic groups in Hawaii–Caucasians, Japanese, Native Hawaiians, and Filipinos. Data are occasionally available for other groups (especially Chinese and Portuguese), but sample sizes limit the generalizability of these results. Indirect evidence and anecdotal evidence (Raymond et al. 1985; Danko, personal communication, 1985) suggest that alcohol abuse and alcohol-related problems may be very high among some of the Asian and Pacific Island subgroups not considered here (e.g., Samoans, Koreans, and Vietnamese), but systematic data are unavailable.

The third objective of this paper is to discuss some of the problems surrounding the measurement of alcohol use and abuse in Hawaii. In this last section, recommendations are made for further alcohol-related research. The reader is cautioned that this paper is not intended to provide a complete overview. Extensive literature is available for further reading and research in this area (e.g., Bickerton 1975; Kent 1983; Nordyke 1977; Daws 1969; Fuchs 1968).

Current Population and Population Issues

Compared with most other States, Hawaii is small, ranking 39th in population, and demographically young, ranking 40th in median age in 1980. The most salient feature of Hawaii's population is its ethnic diversity. Table 1 represents a breakdown of the population by ethnicity for two periods: 1964-1967 and 1982. The population of Hawaii has increased considerably over the recent past. No single ethnic group can claim to enjoy a "majority" status; Hawaii is home to substantial numbers of Caucasians, Japanese, Native Hawaiians, Filipinos, Chinese, and people of mixed ancestry as well as smaller numbers of other groups such as Koreans and Samoans. The largest ethnic groups are Caucasian, Japanese, Native Hawaiian (Part-Hawaiian and full-blooded Hawaiian combined), and Filipinos.

Members of the armed forces and their dependents, whose length of stay in Hawaii is usually less than 4 years, constitute a significant proportion of the Caucasian population, estimated in 1980 to be over 30 percent (Kawaguchi et al. 1981). If these persons are excluded, the Japanese become the largest single ethnic group in Hawaii, but one whose current growth rate is low compared with other groups.

An important point to note about table 1 is that the population estimates were developed by the Health Surveillance Program of the Hawaii State Department of Health. The numbers in table 1 are not census estimates and do not agree with population figures provided by the U.S. Bureau of the Census. Definitions of ethnicity used by the residents and agencies within the State differ from those in reports of the Bureau of Census. For example, persons of mixed race are typically shown separately in data prepared by the Health Surveillance Program. In the 1980 census tabulations, however, these persons were assigned to one of the unmixed groups on the basis of self-identification or the race of the mother. The terms "Hawaiian," "Part Hawaiian," and "Native Hawaiian" have in the past, and are still, subject to different meanings (Bell, personal communication, 1985). In table 1, the term "Hawaiian" denotes people who claim that their ancestry is pure Hawaiian; all others with partial Hawaiian ancestry are labeled as "Part-Hawaiian." The term "Native Hawaiian" has now come to mean pure Hawaiian and Part-Hawaiian combined and is used as such in this paper. A similar definitional problem occurs with the term "Caucasian." Some researchers include Portuguese with Caucasians, and other researchers do not. Portuguese are recognized as a distinct cultural group in Hawaii, and data reviewed here will show that their use of alcohol is different from that of Caucasians.

Table 1 shows that the population mix is changing. Hawaii is continuing to receive sizable numbers of immigrants from foreign countries. In 1979, the last

Table 1.–Ethnic distribution of the population of Hawaii, 1964-1967, and 1982 (excludes persons in institutions, military barracks, Kalawao County, and on Niihau)

	1964-1967[a]		1982		Percent change
Ethnic stock	N	Percent	N	Percent	1964-1967 to 1982
Unmixed	480,523	73.3	681,228	71.2	41.8
Caucasian	167,111	25.5	244,236	25.5	46.2
Japanese	199,752	30.5	213,371	22.3	6.8
Chinese	34,913	5.3	42,555	4.5	21.9
Filipino	51,943	7.9	113,217	11.8	118.0
Hawaiian	7,645	1.2	8,291	.9	8.4
Korean	–[b]	–	17,460	1.8	–
Black or Negro	–	–	9,897	1.0	–
Puerto Rican	4,795	.7	6,891	.7	43.7
Samoan	2,420	.4	12,556	1.3	418.8
Other unmixed or unknown	11,944	1.8	12,745	1.3	235.8[c]
Mixed	175,036	26.7	274,898	28.8	57.1
Part-Hawaiian	119,129	18.2	174,579	18.3	46.5
Non-Hawaiian	55,907	8.5	100,319	10.5	79.4
Total	655,559	100.0	956,118	100.0	45.8

Source: Adapted from table II-3, *The Hawaii State Plan: Population*, 1984, State of Hawaii, Department of Planning and Economic Development. Data are from the Hawaii Health Surveillance Program.

[a] Data were derived from an Oahu survey from April 1, 1964, to March 31, 1967, and a neighbor island survey conducted by the Hawaii State Department of Health during the fall of 1967.

[b] Included in "Other unmixed or unknown."

[c] Derived from the inclusion of Koreans and blacks with other unmixed ethnic groups for 1982.

year for which "final" data are available, there were 8,944 immigrants reporting Hawaii as their State of intended residence (State of Hawaii 1983). The majority of these foreign immigrants came from the Philippines (56.1 percent); also included were sizable numbers of Korean (13.3 percent) and Chinese or Taiwanese (6.6 percent) immigrants. In addition to the Asian immigrants, much larger numbers of Caucasian inmigrants–estimated to be over 17,000 in 1983 (State of Hawaii 1984)–arrived from the U.S. mainland.

Although large numbers of "unmixed" ethnic groups are entering the State, a significant factor in the future ethnic makeup of Hawaii will be the numbers of "mixed," especially non-Hawaiian, residents. In 1982, the Hawaii State Department of Health estimated that 28.8 percent of the population were mixed, of which 18.3 percent were Part-Hawaiian and 10.5 percent had no Hawaiian ancestry.

Outmarriage, involving individuals of different ethnic groups, has always been one of the most significant processes promoting genetic and cultural diversity in Hawaii and, of course, accounts for much of the growth of the Native Hawaiian population. In 1983, over 44 percent of marriages among residents in the State were those in which the bride and groom were of different ethnic groups (State of Hawaii 1983).

Alcohol Use in Hawaii

Alcohol was unknown among Polynesians before contact with European explorers and traders. Hence, Hawaiians had no alcoholic beverages before 1778, the year of their first contact with Europeans, and had no drinking traditions other than those derived from drinking "awa," a kind of soporific made from the roots of the pepper tree (Lemert 1967). By the early 1800s, the Hawaiians, allegedly taught by escaped convicts from Botany Bay, were already knowledgeable about alcohol distillation and were able to produce an alcoholic beverage, "okolehau," from the roots of ti plants.

The early history of Hawaiian drinking suggests that it had sacred as well as secular uses, reflecting a continuity of religious attitudes and customs that surrounded consumption of "awa" (Lemert 1962, 1964). Alcohol was in use in all of the homeland cultures of the various Asian and Caucasian immigrant groups that came to Hawaii. Bickerton (1975) provides a brief overview of the traditional role of alcohol in the homeland cultures of the major ethnic groups in Hawaii. She argues that, except for Caucasians, alcohol use in the homeland cultures was always well integrated into the social processes and was part of the main supportive group activities (e.g., religious and ceremonial drinking) and that use of alcohol, even overindulgence, was seldom defined as dysfunctional. Bickerton (1975) and Lemert (1962) provide good reviews of the history of alcohol abuse and alcoholism in the early postcontact period (1778-1900) in Polynesia and Hawaii, respectively.

While an understanding of the early history of patterns of alcohol use is important, it does not necessarily explain the variations in prevalence of alcohol use in Hawaii. The forces underlying current ethnic variations in Hawaii are probably more modern in origin, although little understood.

Per Capita Consumption

Hawaii is a major consumer of beverage alcohol. Stinson (1984) found that per capita consumption of ethanol in Hawaii has increased in a "striking and relatively consistent" manner since 1970, changing the State's relative national ranking from 26th in 1970 to 5th in 1982. He surmised that since the beverage industry computes rates based on resident population, the per capita consumption may be inflated due to increases in the visitor population. He may be correct: whereas the resident population increased by 20.9 percent between 1970 and 1980, the average daily number of visitors increased by more than 38 percent in that same period. Hawaii now receives 4 million tourists a year, who probably account for a large proportion of the alcohol consumed in the State. At the present time, there is no way to accurately estimate per capita consumption among the three major components of Hawaii's population: residents, visitors, and military (Carson and Pahia, personal communication, 1985). Hawaii recently enacted legislation that requires suppliers of alcohol to submit reports on all direct and indirect sales made to all licensees and military facilities. This change will soon provide, for the first time, an accounting of the amount of alcohol imported into Hawaii and should allow more accurate per capita consumption rates.

Drinking Prevalence by Sex and Ethnicity

Lemert (1964) was the first to systematically examine ethnic group differences in alcohol use in Hawaii. On the basis of questionnaires and (for individuals with language difficulty) interviews, Lemert obtained data on alcohol use, drinking habits, beverage preferences, and drinking problems from 480 workers on several large sugar plantations on the island of Hawaii in 1959 and 1960. He found that Caucasians led all other ethnic groups in proportion of current drinkers (97.1 percent). Filipinos ranked next (90.1 percent), followed by Japanese (85.3 percent), Puerto Ricans (77.8 percent), and Hawaiians (50 percent).

There are several reasons to question the representativeness of these results. First, the high proportion of Filipino and Japanese drinkers is mainly accounted for by the large percentage of these persons (40.3 percent and 50.0 percent, respectively) who drink "only on special occasions." Additionally, Lemert indicated that over 50 percent of his Hawaiian sample were Mormon, which is far greater than expected for any random sampling of Native Hawaiian plantation workers. While Lemert's study has serious flaws, it is of some historical value in that it was also the first to seek data relating directly to the issue of continuity and change over time of drinking habits among the various ethnic groups who migrated to Hawaii.

Around the same time Lemert was studying drinking in the plantation system, a larger and more representative study of patterns of alcohol consumption was being conducted on Oahu by the Economic Research Center of the University of Hawaii. The purpose of this study was to provide data to assist the Honolulu Liquor Commission in formulating public policy on the granting of liquor licenses. Results of the study were never formally published nor released for circulation. The raw data are no longer in existence, and only a single report (Voss 1961) is known to be available at the Honolulu Liquor Commission. This study involved two-stage cluster sampling of households on Oahu

Table 2.—Prevalence of alcohol use by ethnicity and sex on Oahu, 1960, in percent

Ethnic group	Male	Female	Total
Caucasian	80.3	69.0	74.2
Native Hawaiian	74.5	51.0	62.1
Japanese	72.1	26.9	50.0
Chinese	69.7	42.0	58.0
Filipino	62.5	26.2	46.2
Other	79.5	40.0	62.0
All ethnic groups	74.2	47.0	60.7

Source: Adapted from Voss (1961).

followed by interviews of 2,106 adults aged 20 and over. In addition to questions about their drinking habits (quantity, frequency, and so on), respondents were questioned about their attitudes toward drinking and liquor control.

Table 2 presents results from this survey relating to the prevalence of alcohol use by ethnicity and sex. The table shows that there are significant differences in the prevalence of drinking among ethnic groups and between males and females within the same ethnic group. The highest proportion of drinkers is found in the Caucasian, Native Hawaiian, and "other" groups, followed by the Chinese, Japanese, and Filipino groups. As will be seen, patterns very similar to those presented in table 2 have been obtained in nearly all subsequent studies.

Voss did not transform his quantity-frequency data to ethanol consumption but did examine patterns of drinking (light, moderate, and heavy) by ethnicity and sex. The practice of partitioning drinking behavior and ethanol consumption into categories has been common to all subsequent survey research on alcohol use in Hawaii (Johnson et al., in press; Wilson et al. 1978; Bickerton 1975). Murakami (in this volume) and Le Marchand (in this volume) continue this practice in their most recent epidemiological research in Hawaii. However, comparison of the several studies that give information on drinking patterns by ethnicity is nearly impossible. The number of patterns vary between three (Voss 1961) and seven (Bickerton 1975); the definitions of any given category (e.g., heavy drinking) vary greatly between studies; and, last, the various studies do not use comparable analyses (e.g., some partition by sex and ethnicity, others do not).

In the late 1960s and early 1970s, research in Hawaii on ethnic differences was mainly concerned with the issue of prevalence of alcohol abuse and alcoholism as indexed by alcoholism admission rates to various treatment facilities. (These studies are covered in a later section of this paper.) Interest in the drinking habits of the general population in Hawaii resurged in the mid-1970s from two sources: (1) researchers at the University of Hawaii who were interested in the influence of culture and ethnicity on alcohol-related behaviors, and (2) the Hawaii State Alcohol and Drug Abuse Branch (ADAB), which was concerned with the issue of needs-based planning for the development and implementation of appropriate drug- and alcohol-related services. University-based research will be considered first.

Bickerton (1975), as part of her doctoral research, conducted a survey of 304 residents of Oahu (females = 154, males = 150). Respondents were adults (aged 18 and over) from households obtained via a two-stage cluster sampling technique. The interview was designed to elicit information on drinking patterns, problems related to drinking, beverage preferences, and various details about the locations and company in which drinking took place. Bickerton also contacted parents of the respondents and administered a shorter version of the questionnaire in order to examine issues about generational change. Bickerton's results on ethnic variation of drinking prevalence are shown in table 3.

Her results show Native Hawaiians as having the highest prevalence of alcohol use, followed closely by Caucasians and Japanese. Her prevalence estimates are considerably higher for all sex and ethnic groups than those obtained by Voss (1961). Differences between the sexes are not as great as Voss found. It cannot be determined if these discrepancies are the result of Bickerton's having sampled from a younger age group than did Voss or whether the effect was

Table 3.—Prevalence of alcohol use by ethnicity and sex on Oahu, 1974, in percent

Ethnic group	Male	Female	Total
Caucasian	85.1	83.3	84.3
Native Hawaiian	100.0	83.3	91.1
Japanese	94.9	71.1	82.1
Chinese	83.3	44.4	66.6
Filipino	100.0	44.4	71.4

Source: Adapted from Bickerton, unpublished dissertation (1975).

based on a much smaller sample size.

In 1975, researchers at the Behavior Biology Laboratory of the Pacific Biomedical Research Center initiated a research project specifically designed to address the issue of ethnic group differences in alcohol-related behavior. This study was concerned with the use and abuse of alcohol and attitudes toward alcohol among adults (aged 20 and over) in six ethnic groups on Oahu: Caucasians, Native Hawaiians, Japanese, Chinese, Filipinos, and "Hapa haoles"—a Hawaiian term indicating individuals with one parent of Caucasian ancestry and the other parent of Oriental ancestry. The Hawaii Alcohol Study (HAS) remains the most comprehensive study on alcohol-related behavior in Hawaii to date. Results from this study have been extensively reported (Johnson et al., in press; Ahern et al. 1984; Foch et al. 1984; Schwitters et al. 1982*b,c*; Wilson et al. 1978). Other research concerned with genetic and psychosocial aspects of alcohol-related behaviors (Ahern et al. 1985; Wilson et al. 1984) has developed from this project. Data from various sources (including the HAS) on alcohol consumption and the flushing response (Johnson, in this volume) and additional details regarding sampling and fielding procedures will be provided in the HAS report.

Unlike earlier studies, the HAS distinguishes nonusers in terms of those who formerly used alcohol and quit and those who claim never to have used alcohol. Table 4 (Johnson et al., in press) gives results on prevalence of alcohol use versus nonuse by ethnicity. Results from the HAS confirm, as in earlier studies, that Caucasians are most likely to use alcohol compared with other ethnic groups in Hawaii. Prevalence rates for Native Hawaiians, Chinese, and Japanese are nearly identical, and Filipinos are least likely to have used alcohol or to have tried alcohol and quit.

Wilson et al. (1978) and Schwitters et al. (1982*a*) analyzed HAS data regarding symptoms and problems associated with alcohol use. They found no differences between ethnic groups in the average number of problems and in the mean number of symptoms. They also found that symptoms and problems were associated with the amount of alcohol consumed and not with ethnicity per se.

Johnson et al. (1985) examined reasons given by drinkers for drinking, abstainers for not drinking, and former drinkers for giving up alcohol. They found that although there were differences among ethnic groups in the endorsement of reasons, there was an even

Table 4.—Alcohol use by various ethnic groups: Hawaii Alcohol Study, 1975

Ethnic group	Total	Abstainers N	Abstainers Percent	Former drinkers N	Former drinkers Percent	Drinkers N	Drinkers Percent
Caucasian	674	29	4.3	96	14.2	549	81.5
Native Hawaiian	640	71	11.1	124	19.4	445	69.5
Japanese	645	108	16.7	102	15.8	435	67.4
Chinese	656	116	17.7	86	13.1	454	69.2
Filipino	654	203	31.0	129	19.7	322	49.2
Hapahaole	443	31	7.0	57	12.9	355	80.1

Source: Johnson et al. (1985).

Table 5.–Lifetime prevalence, current use, and new use of alcohol by ethnicity in Hawaii, 1979, in percent

Ethnic group	Lifetime use	Current use	New use in past year
Caucasian	91.4	77.7	1.0
Native Hawaiian	80.8	52.8	4.3
Japanese	77.6	44.6	4.3
Chinese	72.5	40.5	2.6
Filipino	52.8	36.1	2.3
Portuguese	86.5	52.6	6.6
Other	76.4	51.3	3.2
Total	79.2	55.1	2.9

Source: State of Hawaii, Department of Health (1979).

stronger association with alcohol consumption independent of ethnicity, with all reasons being more likely to be endorsed as consumption increased.

The first statewide survey of alcohol use was begun in 1975 by the Epidemiology Program of the Cancer Research Center with the cooperation and assistance of the Hawaii State Health Surveillance Program of the Hawaii State Department of Health. The Health Surveillance Program conducts a continuous statewide survey of the health and sociodemographic condition of the state. A brief two-page questionnaire was appended to the standard questionnaire to obtain data on dietary habits, smoking, and drinking. Preliminary results on smoking and drinking patterns among different ethnic groups were reported by Kolonel (1979), and the survey was continued until 1980. Results from the completed survey are provided by Le Marchand (in this volume).

This statewide survey is currently the largest set of data on alcohol use among ethnic groups in Hawaii but contains only limited information on alcohol-related behaviors. Because this survey was not specifically designed to obtain needed statewide data on alcohol abuse and alcohol-related problems, the Alcohol and Drug Abuse Branch, Hawaii State Department of Health, conducted a separate statewide survey in 1979 to meet its needs. The 1979 survey used a two-stage cluster sampling technique to select households throughout the main island except Niihau. A total of 3,127 persons aged 12 and older from 2,932 households were included in the survey. Approximately 1.3 percent of the households contained individuals who could not be included due to non-English-speaking residents. The data from this study include information on a broad array of substances, including nonalcoholic beverages (coffee, tea, etc.), alcoholic beverages, over-the-counter drugs, prescription drugs, and other legal and illegal substances (marijuana, opiates, methadone, etc.). Detailed information was obtained regarding quantity of alcohol consumed, frequency of consumption, preferences, drinking practices, reasons for drinking, and attitudes toward alcohol.

Results from this survey are available in a single report (State of Hawaii 1979), called the ADAB/1979 report, issued in 1980 by the Alcohol and Drug Abuse Branch of the Mental Health Division of Hawaii's Department of Health. Prevalence rates are reported for specific ethnic groups on current use (in the past month), lifetime use (ever had a drink), and new use (first time in the past year). Sex- and age-specific rates are reported separately, but not sex by ethnic group nor age by ethnic group results. The report also gives estimates of alcohol abuse as well as results relating to a separate data base of admissions to 21 treatment facilities in the State during FY 1979-1980. Table 5 gives prevalence rates for the various categories of alcohol use. The statewide estimates of prevalence rates for current use are all lower than estimates obtained by the HAS survey, but the rank order for the five major ethnic groups remains the same.

The difference between the HAS results and the statewide estimates may be due to the fact that the HAS respondents were those living on Oahu, whereas the ADAB/1979 survey sampled statewide. Nevertheless, the ADAB/1979 results have a pattern similar to previous studies. Caucasians have the highest prevalence of lifetime and current usage. Native Hawaiians rank second, although their rates are very similar to

Portuguese and "others." Filipinos have the lowest prevalence of current use and lifetime use. Just as in the HAS studies, these data indicate that there are ethnic group differences in the proportions of former drinkers. There are also ethnic group differences in the prevalence of new use in the past year, but it is not clear if new use means first use or renewal of drinking after quitting.

Recently, the Mental Health Division of the Hawaii State Department of Health and the School of Public Health of the University of Hawaii conducted a statewide survey that sought to obtain additional data on alcohol, drug, and mental health needs. Results from this survey are not yet fully analyzed. Preliminary results on alcohol use and abuse and associated factors among the four major ethnic groups are discussed by Murakami (in this volume). Her results show, as before, that there are large sex differences within ethnic groups and also that there are large differences in use versus nonuse across ethnic groups. Her results also generally confirm that Caucasians and Native Hawaiians have a higher prevalence of alcohol use in comparison with other ethnic groups of like sex.

Alcohol Abuse and Alcoholism

Several attempts have been made over the years to estimate the total number of alcoholics in Hawaii. Voss (1961) applied the now outmoded Jellinek formula and estimated the statewide total to be over 12,000. Voss computed ethnic- and sex-specific rates and showed that the highest estimated rate of alcoholism was among Filipino males. Subsequent research, as is shown here, suggests that he was probably incorrect. There is ample evidence that Filipinos are among the most abstemious of all ethnic groups in the islands.

Burtness et al. (1974) adopted the national average rate of alcoholism of 4.5 to 5 percent and applied it to Hawaii to arrive at a statewide total of over 40,000. These researchers did not consider that ethnic group differences between Hawaii and the U.S. mainland might produce very different rates of alcoholism.

Admission to treatment facilities with alcohol-related problems and diagnoses of alcoholism upon admission have been the most common indicators of relative rates of alcohol abuse and alcoholism across ethnic and racial groups in Hawaii. Several such studies have looked at admission rates for hospitals, clinics, and psychiatric facilities. Wedge and Abe (1949), using 1947 alcohol-related admissions to a psychiatric division of a major Oahu hospital (Queen's), estimated alcoholism rates of 99 per 100,000 for Caucasians, 25 per 100,000 for Hawaiians, 7 per 100,000 for Japanese, 4 per 100,000 for Filipinos, and 0 per 100,000 for Chinese (cited in Bickerton 1975).

Bickerton (1975) reports general admissions including alcoholism admissions to mental health clinics in 1967 and 1968 by ethnicity and shows the following percentages: Caucasians, 73 percent; Hawaiians, 11.5 percent; Japanese, 9.6 percent; and Filipinos, 9.5 percent. She further shows that the higher rate for alcoholism for Caucasians is not merely due to a higher proportion of general admissions but notes that for every non-Caucasian group, the rate of general admissions is at least double that for alcohol admissions, whereas the Caucasian rate for alcohol admissions is more than three times the general admission rates.

In a later study, Bickerton (1977) analyzed 1,144 admissions to the Hawaii State Detoxification Unit in 1973. Caucasians and Portuguese had the highest admission rates (73 percent and 9.9 percent, respectively), compared to their proportion in the population (29.0 percent and 4.0 percent, respectively). All other groups had admission rates lower than expected. Admission rates to population ratios for other ethnic groups were Native Hawaiian, 8.0 percent:17.2 percent; Japanese, 4.7 percent: 26.8 percent; Chinese, 0.7 percent:3.9 percent; and Filipino, 0.7 percent: 7.9 percent. Bickerton suggested that the high admission rates of Caucasians might be due to the propensity of Caucasians who are admitted through hospital referrals to choose to enter detoxification programs because they do not have friends or family. She examined hospital emergency room admissions and discharges in a major Honolulu hospital and found that for alcohol-related admissions, Caucasians were equally as likely to be discharged to friends and family as they were to be admitted to detoxification programs. She concluded that "while the absence of family ties might tend to increase the overrepresentation of Caucasians in Detox, it would hardly be the sole or even major case for this state of affairs" (Bickerton 1977, p. 360).

McLaughlin et al. (1975) examined admissions to the State mental hospital for 1973 and 1974 and computed age-corrected admission rates for alcoholism for different ethnic groups. They found highly significant differences in admission rates across the ethnic groups for both sexes. The 1-year adjusted rates per 1,000 population for males showed Caucasians to have the highest rate (0.79) followed by Native Hawaiians (0.33), Filipinos (0.14), Japanese (0.14), and Chinese (0.05).

For females, the rates were significantly lower compared with males but the patterns were similar: Caucasians ranked first (0.31), followed by Native Hawaiians (0.04), Filipinos (0.04), and Japanese (0.004). There were no Chinese females admitted for that period.

White and Landis (1982) provide data on the mental health/physical health and socioeconomic condition of Native Hawaiians in contrast to non-Hawaiians. White and Landis used a subset of the Hawaii State Mental Health Client Registry from the period 1973 to 1978 and analyzed the complete "service path" of clients in the mental health system. A comparison between Native Hawaiians and non-Hawaiians showed that 7.1 percent of non-Hawaiians were diagnosed as alcoholic, but only 3.3 percent of Native Hawaiians received this diagnosis. Native Hawaiian rates were higher on 6 of 11 other diagnostic categories.

The ADAB/1979 report reported statewide estimates of alcohol abuse for age, sex, and ethnic groups in Hawaii. As mentioned above, there were no cross-tabulations that showed age- or sex-adjusted results. Alcohol abuse was defined as the daily consumption of 2 or more ounces of pure ethanol in the month prior to the survey. Data are presented in table 6 for those who abuse alcohol only and in table 7 for those who abuse both alcohol and other drugs. Table 8 shows a comparison between alcohol abusers as defined by 2 ounces of ethanol consumption per day or more and alcohol abusers as defined by being admitted to alcohol treatment facilities and programs.

Results in tables 6 through 8 generally confirm the results that were previously described for smaller or more geographically limited samples. Caucasians are seen to be the group most likely to be in the category of alcohol abuser. Caucasians and Native Hawaiians are overrepresented relative to their population size. Nearly three-fourths of individuals who abuse both alcohol and drugs are either Caucasian (49 percent) or Native Hawaiian (22.8 percent).

Relative to their population, Native Hawaiians are slightly overrepresented as abusers but much underrepresented in alcohol treatment facilities. All other groups are underrepresented as abusers relative to their proportions in the population and underrepresented in treatment facilities in proportion to their respective estimated number of abusers. Underutilization of mental health facilities, including alcohol treatment programs by non-Caucasians, is a frequently observed "problem" for mental health-, drug-, and alcohol-related research in Hawaii.

Several studies and reports are available that examine alcohol-related morbidity and mortality in Hawaii. Stinson (1984) reported alcohol-related mortality for Hawaii over the period 1975-1980 using 1980 census estimates to compute mortality rates. He concluded that of eight alcohol-related causes of death, only three show Native Hawaiians to be at greater risk than the general State population: homicide (13.67 versus 6.23 deaths per 100,000 population), motor vehicle accidents (37.07 versus 17.56), and suicide (14.40 versus 10.81). For two other causes, Native Hawaiians are at less risk than Caucasians: alcohol cirrhosis (2.40 and

Table 6.—Estimated number and percentage of alcohol abusers by ethnicity in Hawaii, 1979

Ethnic group	Percent of State population	Alcohol abusers: Estimated number	Alcohol abusers: Percent of abusers	Alcohol abusers: Percent of ethnic group
Caucasian	27.8	21,845	40.6	11.1
Native Hawaiian	15.8	10,445	19.4	9.4
Japanese	23.2	6,175	11.4	3.7
Chinese	5.0	1,084	2.2	3.2
Filipino	10.2	4,734	8.8	3.2
Portuguese	2.2	904	1.7	5.9
Other	15.7	8,628	16.0	7.8
Total	99.9[a]	53,803	100.1[a]	7.6

Source: State of Hawaii, Department of Health (1979).

[a] Total does not add to 100 due to rounding.

Table 7.—Estimated number and percentage of alcohol/drug abusers by ethnicity in Hawaii, 1979

Ethnic group	Percent of State population	Alcohol/drug abusers: Estimated number	Percent of abusers	Percent of ethnic group
Caucasian	27.8	5,955	49.0	3.0
Native Hawaiian	15.8	2,777	22.8	2.5
Japanese	23.2	762	6.3	.5
Chinese	5.0	37	.3	.1
Filipino	10.2	42	.3	.1
Portuguese	2.2	583	4.8	3.8
Other	15.7	2,007	16.5	2.0
Total	99.9[a]	12,163	100.0	1.7

Source: State of Hawaii, Department of Health (1979).
[a]Total does not add to 100 due to rounding.

Table 8.—Number and percentage of alcohol abusers and alcohol treatment admissions (fiscal year 1979-1980) in Hawaii, 1979

Ethnic group	Alcohol abusers: N	Alcohol abusers: Percent	Alcohol treatment admissions: N	Alcohol treatment admissions: Percent
Caucasian	21,845	40.6	1,081	70.8
Native Hawaiian	10,445	19.4	157	10.2
Japanese	6,157	11.4	56	3.7
Chinese	1,084	2.2	3	.2
Filipino	4,734	8.8	35	2.3
Portuguese	904	1.7	26	1.7
Other	8,628	16.0	165	10.8
Total	53,803	100.1[a]	1,526	99.7[a]

Source: State of Hawaii, Department of Health (1970).
[a]Total does not add to 100 due to rounding.

4.60 deaths per 100,000 population) and cirrhosis (4.37 versus 7.48). However, Stinson pointed out a discrepancy between reports of the U.S. Bureau of Census and the Hawaii State Department of Health for estimates of the Native Hawaiian population (12.3 percent and 15.8 percent, respectively). It is not clear if the pattern of his results or interpretations would have changed had he used locally provided estimates. McLaughlin and Rashad (1976) found that alcoholic Caucasians had significantly lower death rates due to cirrhosis of the liver than did alcoholic Orientals (Japanese, Chinese, and Filipinos) and that alcoholic Caucasian males had significantly fewer occurrences of organic brain syndrome. There were too few Oriental females for a comparative analysis. These results were interpreted as suggesting that alcohol had more harmful effects for Orientals than Caucasians.

Discussion

At the present time, there is great variability of estimates of the prevalence of alcohol users, abusers, and alcoholics within any ethnic group in Hawaii. A large gap exists in our knowledge of alcohol-related behaviors among Hawaii's numerically smaller ethnic groups and certain groups that should be especially valuable for cross-cultural research, such as new immigrants to Hawaii and the children of "mixed" marriages.

The accumulated evidence presented here seems to indicate that Caucasians and Native Hawaiians do not differ significantly from each other in current use of alcohol but that these two ethnic groups differ significantly from Japanese, Chinese, and Filipinos. Filipinos and Chinese rank lowest on most estimates of alcohol use, with Japanese the intermediate level. The few studies that look at sex differences show that females use alcohol far less than males and that the pattern of ethnic group variation among females is the same as for males. Few data are available for examining specific rates by sex, age, and ethnic group.

Several large data sets are now available from the State of Hawaii or from research units at the University of Hawaii that offer an opportunity to determine these rates. A cross-validation of these data bases–each analyzed according to a common set of procedures and definitions–is in order.

Use of alcohol and drugs by young adults is common in Hawaii (State of Hawaii 1985). More research is needed to examine alcohol use and abuse among children and youth in Hawaii. The ADAB/1979 report estimated that of the over 100,000 substance (alcohol and drug) abusers in Hawaii, approximately 7.9 percent were aged 12 to 17. In addition, according to this report, some 6.1 percent of the estimated 53,803 alcohol abusers were youth aged 12 to 17. The ADAB/1979 report, however, did not give an ethnic breakdown of the distribution of alcohol or drug abuse within this age group.

In 1980, the Hawaii State Department of Health and the Department of Education initiated several Risk Reduction Projects (State of Hawaii 1985) designed to prevent or delay the onset of the first use of alcohol, cigarettes, and marijuana among students in grades 7 through 12 in several schools on Oahu and Hawaii. The final report contains results from surveys of the target populations. This report, while containing extensive analyses on alcohol, cigarette, and marijuana usage by age, sex, and grade level, provides little information on substance use by ethnic groups. The Risk Reduction Projects found that the frequency of heavy beer use (weekly or daily) was fairly evenly distributed among the Caucasian, Japanese, and Filipino groups but that of those Native Hawaiian youth who drank, heavy drinking was more than twice as likely as moderate or infrequent drinking (Stringfellow, personal communication, 1985).

Studies are needed that examine familial resemblance for alcohol-related behaviors among different ethnic groups in Hawaii. Of even greater value would be longitudinal family studies that examine the family processes whereby children of different ethnic groups develop their attitudes and alcohol-related behaviors. There is some indirect evidence, using data from the Hawaii Alcohol Study, that family dynamics may be important. Harris (1985) analyzed self-reports on individual drinking and family drinking.

She found that respondents' reports of heavy drinking among their own parents were not related to their own self-reported heavy drinking. However, her analyses also suggested that men whose drinking was in the upper quartile tended to report the presence of heavy-drinking brothers. These results suggest that there may be some facilitation of drinking behaviors by sibling influences. Ahern et al. (1984) found generally high concordance between husbands and wives for alcohol-related behaviors. Since measurements were available for only a single occasion, he could not determine whether husbands and wives come to their marriage with similar beliefs and behaviors or whether there was a "change" toward concordance over time.

This discussion has suggested several "gaps" in our knowledge about the prevalence of alcohol use among different groups in Hawaii. It is also appropriate to mention briefly some methodological issues and problems associated with alcohol-related research (especially survey research) in Hawaii. First, there are some difficult problems concerning sampling and fielding for household surveys. An increasingly large number of individuals–especially on Oahu–live in "secured" condominiums, thereby making access and interviewing difficult. There is also the problem of language skills and literacy in English. Sizable numbers of residents–especially the elderly and new immigrants–are more comfortable in their native language or in a version of nonstandard English, i.e., "pidgin English." The match between interviewer and respondent with respect to language, ethnicity, and other attributes is a continuing problem for all survey research done in Hawaii. The conventional wisdom in Hawaii is that "sensitive" topics that require some self-disclosure may require proper matching. Given the large variety of ethnic groups in Hawaii, the perfect match between interviewer and respondent is seldom possible or practical. It is unknown to what degree each ethnic group may be more or less sensitive and unresponsive in mismatched situations. Research on factors associated with the validity of standard survey research techniques needs to be done in Hawaii.

A much more basic problem concerns the very real possibility of different meanings attached to alcohol-related behaviors (e.g., "problems" due to drinking) by different ethnic groups. Social and psychological effects of alcohol will be determined according to the value systems of different cultures and the ways alcohol use is integrated into these systems. Assessment of alcohol-related problems will require an understanding of value systems relative to alcohol. It may be that some drinking problems are defined uniquely and separately for each ethnic group. Research is needed to develop culturally appropriate procedures and techniques for validly measuring alcohol consumption, drinking patterns, and drinking problems. Research that focuses on problems associated with eliciting sensitive information and cultural differences in the meaning of "drinking problems" and "alcohol abuse" is especially needed. Research on these issues is critical as a prelude to prospective studies on the association of ethanol consumption and health. A significant first step along these lines has already been initiated by Hall (personal communication, 1985), who is examining the issue of cross-cucultural sensitivity of the Veterans Alcohol Screening Test. Interpretation of estimates of alcohol abuse among Hawaii's ethnic groups is problematic. The evidence, based on admissions to treatment facilities, generally shows that Caucasians and Native Hawaiians are overrepresented in treatment populations relative to their proportions in the State population. Japanese, Chinese, and Filipinos are generally underrepresented.

Estimates derived from analyses of even the best mental health client registry system may seriously underestimate the real true population values of drug- and alcohol-related problems in Hawaii. For example, the analyses of 1973-1978 client registry data from Hawaii by White and Landis (1982) suggested that the Native Hawaiian clients in the mental health system were only a small, select portion of the Native Hawaiians at risk and that those who did enter the system were a unique group who followed a different "service path" through the system. They recommended that mental health services for Native Hawaiians be made more culturally relevant and that appropriate "culture data" be included in the client registry system.

Even with this suggestion, client registry data in Hawaii may never give an accurate picture of alcohol abuse in Hawaii. There is ample evidence that the various ethnic groups have different preferred modes for dealing with drug, alcohol, and mental health problems. The ADAB/1979 survey reports on sources of help sought by alcohol abusers. Caucasians are about equally as likely to seek help from an alcohol program, a clinic, or a friend. Nearly three-fourths of Native Hawaiians chose to seek help from a friend or family. Very few Japanese, Chinese, or Filipinos needed help, but those who did need help did not choose an institution.

The problems and issues in obtaining good epidemiological data are not insurmountable, and progress is being made. Furthermore, other steps are being implemented or planned that will allow more accurate and culturally sensitive assessment of alcohol abuse or alcoholism. The Mental Health Division of the State's Department of Health has recently revised its client tracking system and will be able to give better estimates of all DSM-III categories (Murakami, personal communication, 1985). The Governor has recently created a task force that makes recommendations for collection and analysis of alcohol-related indices (Wade, personal communication, 1985). The future looks promising for the development of a better understanding of the bases for cross-ethnic variation in alcohol use and abuse in Hawaii.

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Alcohol Use, Abuse, and Alcoholism Among Chinese Americans: A Review of the Epidemiologic Data

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ABSTRACT

Many of the studies on alcohol use, abuse, or alcoholism among Chinese and other Asian Americans have been based on data derived from clinical cases or from community samples of fairly homogeneous age groups. This paper reviews, for the first time, an array of epidemiologic data that recently have been collected on alcohol use among Chinese residents living in the United States, Taiwan, and China. These data have received little attention in the social sciences. The focus on the Chinese population is particularly timely in view of their rapidly growing numbers in the United States. According to the 1980 census, Chinese Americans are the largest Asian American minority group in the United States. The generalization that the Chinese are a population of nondrinkers is worthy of scrutiny, especially in light of more recent findings. Limitations notwithstanding, the use of a standardized instrument in these studies offers the advantage of comparability of data from different geographical areas and suggests the possibility of several exciting cross-cultural studies on alcohol use, abuse, or alcoholism.

Introduction

For more than a decade the bulk of published reports on alcohol research among Chinese Americans has focused on establishing the existence of alcohol consumption and determining the magnitude of physiological reactions to consumption that differentiate Chinese from Caucasian populations. Wolff (1973) reported that 83 percent of the Asian adults compared with 2 percent of the Caucasian adults in his study showed a marked flushing response and increased optical density of the earlobe. Since then, several studies have been conducted to replicate his findings and to identify the mechanisms of this reported Asian sensitivity to alcohol (Ewing et al. 1974; Stamatoyannopoulous et al. 1975; Reed et al. 1976; Hanna 1978; Seto et al. 1978).

In contrast, basic epidemiologic research on the patterns of alcohol use, abuse, and dependence has not kept pace with research on the biochemical underpinnings of differential alcohol reactions between races. To facilitate comparison with Caucasian Americans, the tendency has been to group together as "Asian Americans" diverse ethnic groups who originate from China (including Taiwan and Hong Kong), Japan, Korea, the Philippines, Vietnam, Cambodia, Laos, Thailand, Malaysia, Singapore, Indonesia, India, Pakistan, Bangladesh, Sri Lanka, and Burma. This tendency adds little conceptual clarity to the lamentable state of research on this subject. Unlike Hispanic Americans, who despite their heterogeneity share a common linguistic root, Asian Americans share neither a common language nor a common descent. For this reason, rather than review the epidemiologic data on alcohol use, abuse, and alcoholism among Asian Americans generally, this paper will focus exclusively on Chinese populations in their country of origin and in the United States.

The purpose of this paper is to compare findings obtained from China with those collected by independent researchers from Taiwan and a pretest study conducted in Chicago, using similar instruments–a modified version of the Diagnostic Interview Schedule (DIS). Furthermore, these findings are used as a basis against which to evaluate the most recent U.S. mortality data on cirrhosis of the liver compiled from death certificates and managed by the National Center for Health Statistics (NCHS). Methodological problems in applying the DIS overseas and in using the U.S. mortality data are discussed to call attention to the need for caution in the interpretation of results obtained from these studies. It is hoped that experience in collecting basic epidemiologic data on alcohol use, abuse, and alcoholism among Chinese overseas will provide a sound basis for a more rigorous study to be conducted in the United States.

Brief Review of the Literature

Perhaps the earliest published report on the rarity of alcoholism among the Chinese population was that made by La Barre while he was working as a naval officer during World War II in Kunming. He noted that "the Chinese are not so voluntarily addicted to excessive use of alcohol as have been some northern European people.... The fact seems to be that in spite of ample and even copious consumption of alcohol on defined occasions, its use appears never to become an emotional problem" (La Barre 1946, p. 375). Francis L. K. Hsu made a similar observation while working as a medical and psychiatric social worker at the Peking Union Medical College Hospital in China between 1934 and 1937 (Hsu 1970). In his words, alcoholism is as "rare in China as it appears to be abundant in the United States" (Hsu 1970, p. 67). Indeed, the first systematic psychiatric epidemiologic survey in Taiwan using the key-informant method followed by psychiatric examination yielded only two alcoholics out of 19,931 inhabitants (Lin 1953). Chafetz (1964) quoted Lin as having stated that "there had not been more than 10 cases of alcoholism in 17 years among the Chinese population in Taiwan," although alcohol is readily available and there is no real moral code against drinking.

Certainly, the apparent low rates of alcoholism are not in accordance with the varieties of alcoholic beverages produced locally in both China and Taiwan. In an attempt to understand the differences in the ethos of alcohol consumption between Chinese and American societies, Hsu (1970, p. 66) made a number of insightful observations. First, alcohol is linked with illicit sex, violence, or other antisocial acts in American literature. However, in traditional Chinese fiction, which now forms a part of classical writings, "the intoxicated man has simply been helped by alcohol to be especially brave for carrying out actions socially regarded as good." In a much read Chinese novel, *Shui Hu Zhuan* (translated into English as *All Men Are Brothers*), two of the most colorful characters purposely drank before they committed acts of violence. However, here the similarity ends, as described in the following passage:

> But, typically, neither of them did anything for which they were not better liked. After much drinking, Lu Chih-shen beat a villian to death. The victim was a known enemy of the community. The other, Wu Sung, killed a tiger that threatened the safety of his town, and he later slew his sister-in-law who had previously murdered his brother. On both occasions he drank before taking the lives of these evil ones.
>
> (Hsu 1970, p. 66)

The famous Chinese calligrapher Huai Xu was known to write in his admirable "mad cursive" style as he drank his liquor. The well-known poet Li Po was reputed to compose the finest poetry with the help of some wine. Hence, the common saying "Li Po dou jiu shi bai pian," or a hundred poems flow from Li Po's cup of wine. This phenomenon was apparently so common that Tu Fu, another Chinese poet, wrote the poem "Jiu Zhong Ba Xian Ge" to praise eight of his contemporaries whose prolific writings were made under the influence of moderate amounts of wine.

Thus, in traditional Chinese culture, drinking is sanctioned in defined situations. Ethnographic writings indicate that it is an essential part of religious ceremonies, especially ancestor worship. It is required on festive occasions. At the same time, it is condemned as one of four vices (together with womanizing, gambling, and taking of opiates). In the folk culture, excessive use of alcohol is believed to bring on ninefold harm: (1) impairment of intellect, (2) impairment of morals, (3) predisposition to physical illness, (4) impairment of sexual performance, (5) shortening of lifespan, (6) impairment of fertility, (7) passing of inherited defects, (8) increased risk of suicide, and (9) increase of criminality.

Clearly, there is a distinctive difference in the manner in which Chinese folk culture compared with American folk culture places emphasis on the harmful effects of excessive alcohol use while, at the same time, sanctioning its use in defined situations. Several investigators have noted that Chinese traditionally drink with meals and on ceremonial occasions; however, drinking-centered institutions and groups are absent (Hsu 1970; Wang 1968; Singer 1972; Rin 1978). In contrast, cocktail parties as social functions and happy hours in restaurants and bars are uniquely American institutions. Such a divergence in the folk culture of drinking is bound to manifest itself in differential rates of alcohol use, abuse, and dependence.

The Epidemiologic Data

In 1980, a case identification instrument, the DIS, was released after several years of development jointly undertaken by the National Institute of Mental Health and Dr. Lee Robins and her colleagues at Washington University in St. Louis, Missouri. The DIS is a highly standardized interview schedule designed for use by lay interviewers and intended to assess the presence, duration, and severity of self-reports of individual symptoms (Regier et al. 1984). Its application in community surveys made possible the collection of comparable psychiatric epidemiologic data across cultures, notwithstanding numerous methodological obstacles in field studies and technical difficulties in translations (Robins et al. 1985).

Diagnostic Data from Shanghai

In 1983, the third version of the DIS (DIS-III) was translated into Chinese by a team of psychiatrists from the Shanghai Psychiatric Hospital in China in collaboration with researchers from the Pacific/Asian American Mental Health Research Center in the United States. The translated instrument was used to interview a random sample of 3,098 persons in Shanghai. Questions on alcohol abuse and dependence found in the original English version of DIS-III were modified and applied to provide baseline information that, until that time, had not been collected in China.

Preliminary data analysis shows that out of the 3,098 persons interviewed in Shanghai, only 1.7 percent of Chinese (or 53 persons) had, in their lifetime, drunk daily for a month or more. Of these, only 15 percent (8 persons) had ever told a doctor that they might have a drinking problem, and only 26.4 percent (14 out of 53 persons) were found to be problem drinkers. These 14 persons (or 0.45 percent of 3,098 surveyed) met the DIS/DSM-III criteria for alcohol abuse or dependence. Seven of these persons were considered alcohol abusers, and seven were considered alcohol dependent. The former criterion is met if a respondent reports a positive pattern of pathological use of alcohol, accompanied by impairment in social and occupational functioning. To be categorized as alcohol dependent, the respondent must meet the criterion for alcohol abuse *and* show signs of alcohol tolerance or evidence of withdrawal symptoms. The Shanghai data further indicated that the alcohol problem in China is basically a male problem. Only one of 1,651 females interviewed had a drinking problem and met the DIS/DSM-III criteria for alcohol dependence; none met the criterion for alcohol abuse.

Table 1 shows that no cases of alcohol abuse or dependence were found in the 18-24 age group, 4 cases of alcohol abuse or dependence (1 of whom is female) were found in the 25-44 age group, and the majority of cases, 10 in all, were found in the 45-64 age group. Caseness was not related to educational attainment or marital status. However, a majority of alcoholic cases had a reported monthly income of 80 yuan or more. Of the 14 cases with alcohol problems, only 4 persons reported they had ever tried to stop drinking but failed; only 2 persons had ever tried to seek help for their drinking problem; and only 2 reported having antisocial problems due to drinking.

Diagnostic Data from Taiwan

On the basis of the Shanghai findings, one is likely to conclude that alcohol abuse and dependence are not serious problems among Chinese. Nevertheless, comtemporary research by an independent team of investigators in Taiwan using a similar instrument–the

Table 1.—Cases of alcohol problems for males in Shanghai by age[a]

Age group	Alcohol dependent		Alcohol abuse		Noncases		Total	
	N	Percent	N	Percent	N	Percent	N	Percent
18-24	0	0	0	0	212	100	212	100
25-44	1	.1	2	.3	761	100	761	100
45-64	5	1.0	5	1.0	473	100	473	100

[a]The number of alcohol problems for females is too small to be tabulated.

second version of the DIS, Chinese modification—yielded some startling findings.

Based on a community survey of 5,005 persons in Taipei, Yeh and Hwu (1984) reported that the lifetime prevalence for alcohol abuse is 6.4 percent for males, 0.4 percent for females, and 3.4 percent for both sexes. Lifetime prevalence for alcohol dependence is 2.8 percent for males, 0.1 percent for females, and 1.5 percent for both sexes. These rates are much higher than those reported for Taiwan in 1946-1948 (Lin 1953) and those found in Shanghai in 1983. They are, however, much lower than those reported for the United States in the Epidemiologic Catchment Area studies conducted between 1981-1982 in New Haven, Baltimore, and St. Louis. In New Haven, 19.1 percent of males and 4.8 percent of females met the DIS/DSM-III criteria for alcohol abuse/dependence. In Baltimore, the corresponding figures are 24.9 percent for males and 4.2 percent for females. In St. Louis, they are 28.9 percent for males and 4.3 percent for females (Robins et al. 1984). Among men in Taiwan, as in Shanghai, the 18-24 age group has the lowest rate of alcohol abuse problems (4.84 percent), compared with the other two age groups under 65: 25-44 years (8.12 percent) and 45-64 years (5.53 percent).

In Taiwan the highest rate of alcohol abuse is seen in men in the 25-44 age group, while in China it is found in the 45-64 age group. However, in Taiwan the second highest rate of alcohol abuse problems is seen in the 45-64 age group, and the lowest in the 65 and over age group.

With regard to alcohol dependence, the age pattern is different. The youngest group, 18-24 years, has the highest lifetime prevalence of alcohol dependence (3.46 percent), followed by the late middle-age group, 45-64 years (3.09 percent), the early middle-age group, 25-44 (2.51 percent), and the oldest age group (2.27 percent).

Limitations of the Alcohol Data Collected by Means of DIS

The DIS is designed to collect data on alcohol abuse and alcohol dependence. But the DIS does not yield information on drinking frequency for those whose drinking problems have not yet met the severity criteria specified in the DIS/DSM-III criteria. For this reason, the utility of diagnostic data is limited by the absence of frequency-quantity data among Chinese whose drinking has not reached critical thresholds to qualify as a disorder. The frequency-quantity data would have provided useful contextual information on populations at risk for the development of alcohol problems. Fortunately, when the DIS was used in China, a question on drinking frequency was added.

Drinking Frequency in Shanghai

Table 2 shows the drinking frequency data according to sex. Sixty percent of Shanghainese men and 93 percent of Shanghainese women do not drink at all. Twenty-nine percent of the men drink occasionally, compared with 7 percent of the women, and 11 percent of the men and 1 percent of the women drink sometimes or often. The observed sex differences in alcohol abuse and dependence are paralleled by differences in the frequency of drinking.

A further breakdown of the data by sex and age indicates an inverse relationship between age and abstinence from alcohol, with proportionally more younger people abstaining from drinking (table 3). Conversely, a large percentage of Chinese in the older age groups drink sometimes or often. Among men, close to 1 in 15 persons (6.3 percent) in the 25-44 age group drink sometimes or often, compared to 1 out of every 5 persons (21 percent) in the 45-64 age group. Among women, the corresponding figure is only 0.6 percent for the 25-44 age group and less than 2 percent

Table 2.–Frequency of alcohol use in Shanghai by sex

	Male		Female	
	N	Percent	N	Percent
Frequency of use				
Not at all	869	60.1	1,528	92.6
Occasionally	414	28.6	107	6.5
Sometimes	87	6.0	11	.7
Often	75	5.2	5	.3
Total	1,445	100.0	1,651	100.1

Table 3.–Frequency of alcohol use in Shanghai by sex and age

	Not at all		Occasionally		Sometimes		Often		Total	
Age group	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Male										
18-24	128	60.4	70	33.0	14	6.6	0	0	212	100.0
25-44	483	63.5	229	30.1	35	4.6	13	1.7	760	100.0
45-64	258	54.5	115	24.3	38	8.0	62	13.1	473	100.0
Female										
18-24	231	94.7	12	4.9	1	.4	0	0	244	100.0
25-44	816	92.3	62	7.0	3	.3	3	.3	884	100.0
45-64	480	91.9	33	6.3	7	1.3	2	.4	522	100.0

Table 4.–Frequency of alcohol use in Shanghai by sex and education

	Not at all		Occasionally		Sometimes		Often		Total	
Education	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Male										
Elementary or less	96	44.0	55	25.2	28	12.8	39	17.9	218	100.0
High school or more	772	63.0	359	29.3	59	4.8	36	2.9	1,226	100.0
Female										
Elementary or less	344	90.8	27	7.1	8	2.1	–	–	379	100.0
High school or more	1,183	93.1	79	6.2	8	.6	–	–	1,270	100.0

for the 45-64 age group. Among both males and females who had ever drunk for a month or longer and for whom we have information on the age at which they first got drunk, the median age is 24.5 years.

For Shanghainese men, the frequency of drinking is significantly associated with education (table 4). A larger percentage of men with less than a high school education drink sometimes or often (31 percent) compared with men who have a high school education or more (8 percent). For women, drinking frequency is only modestly associated with education. The majority of women with less than a high school education (91 percent) do not drink at all; some 7 percent of these women drink occasionally, and another 2 percent drink sometimes or often. For women with a high school education or more, as many as 93 percent do not drink at all, compared with 6 percent who drink occasionally and less than 1 percent who drink sometimes or often.

Income seems to be associated with frequency of drinking, especially for men. Table 5 shows that for the two groups of Shanghainese men with an income of less than 65 yuan a month, the percentage who drink

Table 5.—Frequency of alcohol use in Shanghai by sex and monthly income

Income (yuan)	Not at all		Occasionally		Sometimes		Often		Total	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
Male										
Under 50	115	60.5	64	33.7	9	4.7	2	1.1	190	100.0
50-64	313	64.9	138	28.6	24	5.0	7	1.5	482	100.0
65-79	199	56.4	109	30.9	24	6.8	21	6.0	353	100.0
80 and above	222	55.9	101	25.4	29	7.3	45	11.3	397	100.0
Female										
Under 50	352	94.1	18	4.8	4	1.1	–	–	374	100.0
50-64	662	92.7	47	6.6	5	.7	–	–	714	100.0
65-79	307	91.9	23	7.0	4	1.2	–	–	334	100.0

sometimes or often does not differ very much. But for those who reported a monthly income of 65-79 yuan, some 13 percent drink sometimes or often. Of those with a monthly income of 80 yuan or more, close to 1 in 5 persons (19 percent) drink as frequently. Among women, a similar but less pronounced pattern is observed (table 5). First of all, the number of women who drink sometimes or often is extremely small, regardless of income. But the percentage of abstainers decreases with higher income levels, with the highest income group (80 yuan or more) exhibiting the largest percentage of occasional and frequent drinkers combined.

When education is controlled, the role of income is less clear. Table 6 shows that for women with a primary education or less, the percentage of nondrinkers varies little by income. Among women with a high school education or more, the percentage of occasional drinkers increases somewhat with higher income levels, but the percentage of more frequent drinkers remains very small. More significant is the large number of abstainers among Chinese women, regardless of income or education.

Among men, given the same level of income, proportionately more persons with less than a high school education drink either sometimes or often, compared with those with a high school education or more. Within the less educated group (primary education or less), the percentage of persons who often drink settled between 16-19 percent, varying little by income. But among the better educated Chinese (high school education or more), higher levels of income seem to be associated with drinking sometimes or often.

Despite this relationship, it should be kept in mind that the percentage of drinkers remains small. Only 6 percent of better educated men with monthly incomes of less than 50 yuan drink sometimes or often; about 5 percent of those with incomes between 50-64 yuan drink as frequently. The corresponding figure for an income of 65-79 yuan is 8.2 percent. The largest percentage (14 percent) is to be found in the highest income group, 80 yuan or more.

It would be useful to compare the above data on drinking frequency in Shanghai with those found for Taiwan, if such data were available. Unfortunately, Yeh and Hwu's (1984) paper does not contain such information. Suffice to say that this comparison of Chinese psychiatric epidemiologic data reveals that alcoholism was lowest in Taiwan during 1946-1948 and highest in Taiwan in 1982, with the Shanghai data collected in 1983 showing an intermediate percentage of problem drinkers. An excess of male-to-female problem drinkers is found in both societies, with proportionately fewer young people having such problems than older people. Although the possibility exists that the observed differences may be an artifact of the research procedures employed in each setting, the likelihood that they may accurately reflect the *rank order* of the magnitude of drinking problems experienced by these societies at different historical developmental periods cannot be overemphasized. In 1983, Shanghai certainly was beginning to undergo gradual social change, but it still was developmentally much closer to Taiwan in the 1946-1948 period than in 1982. By the 1980s, Taiwan had in fact survived a decade of rapid social change, which, in Southeast Asia, is second only to that of Japan. It is not surprising, therefore, to see traditional Chinese values toward drinking disintegrating as modernization made its way to Taiwan. Of all groups, the young would be the most likely to acquire and practice the "modern" lifestyle filled with Western influences. Drinking as a way of coping with

Table 6.–Frequency of alcohol use in Shanghai by sex, education, and monthly income

Education/ Income (yuan)	Not at all		Occasionally		Sometimes		Often		Total	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
					MALE					
Elementary or less										
Under 50	0	0	2	100.0	0	0	0	0	2	100.0
50-64	11	39.3	8	28.6	4	14.3	5	17.9	28	100.0
65-79	27	44.3	13	21.3	11	18.0	10	16.4	61	100.0
80+	56	44.8	32	25.6	13	10.4	24	19.2	125	100.0
High school or more										
Under 50	114	61.0	62	33.2	9	4.8	2	1.1	187	100.0
50-64	302	66.5	130	28.6	20	4.4	2	.4	454	100.0
65-79	172	58.9	96	32.9	13	4.4	11	3.8	292	100.0
80+	166	61.0	69	25.4	16	5.9	21	7.7	272	100.0
					FEMALE					
Elementary or less										
Under 50	128	92.1	8	5.8	2	1.4	1	0.7	131	100.0
50-64	101	91.0	9	8.1	1	.9	0	0	111	100.0
65-79	56	88.9	5	7.9	1	1.6	1	1.6	63	100.0
80+	37	88.1	3	7.1	1	2.4	1	2.4	42	100.0
High school or more										
Under 50	224	95.3	10	4.3	1	.4	0	0	235	100.0
50-64	561	93.0	38	6.3	4	.7	0	0	603	100.0
65-79	251	92.6	38	6.6	1	.4	1	.4	291	100.0
80+	121	89.6	13	9.6	0	0	1	.7	135	100.0

stress is a less foreign lifestyle in modern society than in the old social order, in which Confucian precepts and Taoist philosophies preached moderation in all things. This may account for the high rate of problem drinkers among young adults in Taiwan compared with Shanghai.

Still, the different age groups that seem to suffer most from alcohol problems in Taiwan and in Shanghai during the decade of the 1980s deserve to be studied. It may be that the alcohol vulnerability of Shanghainese in the 45-64 age group may be a cohort effect exaggerated by the relatively high cost of alcoholic beverages in

China vis-a-vis a working man's monthly wage, which makes it difficult for many young people to have ample opportunities to drink. Production of beer was not based on consumer demands nor intended to satisfy such demands. The notion of intensive advertisement and competitive marketing of liquor products in order to increase sales and production was not an essential ingredient of the socialist economy. Furthermore, at the time the Shanghai Psychiatric Epidemiologic Survey was conducted, a bottle of beer cost about 2 yuan, and the average monthly salary was about 60 yuan. At that price, many young people simply could not afford to get intoxicated. The circulation of cash was sluggish in an economy where the young must wait for job assignments from the government rather than being allowed to search for their own means of livelihood. Moreover, the social milieu in China at the time was not one of laissez-faire or openness toward all things new and foreign as it is today. Severe criticisms befell the person who spent his money recklessly on liquor. These differences in societal contexts between China and Taiwan may well have accounted for the different proclivities among adults in various age groups toward alcohol problems.

Data on Chinese in the United States

Psychiatric epidemiologic data of the type collected in Shanghai and Taiwan in the 1980s are simply nonexistent for Chinese American populations. The five Epidemiologic Catchment Area studies in the United States do not include an Asian American, much less a Chinese, subsample. Consequently, there is virtually no systematic data on the drinking patterns of Chinese Americans nor an estimate of the extent of alcohol problems for this population.

The National Health Interview Survey Data on Alcohol Frequency

The best national information we have on drinking frequency is encompassed under the rubric "Asian/Pacific Americans" in the 1977 National Health Interview Survey (HIS) conducted by the National Center for Health Statistics (NCHS). The HIS consists of a continuous sampling and interviewing of 41,000 households annually nationwide. In 1977, data on the health practices of Asian/Pacific Americans were obtained on a one-third subsample of persons aged 20 and over. Of these, there was one question on drinking frequency (Yu et al. 1984). The results showed that 32 percent of 256 Asian/Pacific Americans in the one-third subsample never drank alcoholic beverages or liquor, 52 percent drank occasionally, 9 percent drank once or twice a week (comparable to "sometimes"), and 8 percent drank three or more times a week (comparable to "often"). Unfortunately, the Asian American subsample cannot be disaggregated further to identify the Chinese Americans from other subgroups. Nonetheless, the general impression that there are more Chinese abstainers than Chinese drinkers seems to be supported by the HIS data.

The Kaiser-Permanente Data from Oakland-San Francisco

Using data on patients from the Kaiser-Permanente Medical Care Program in Oakland-San Francisco between July 1964 and August 1968, Klatsky et al. (1977) reported the proportion of drinkers and nondrinkers among persons of white, black, and "yellow" (i.e., Oriental) races. The majority (57 percent) of those classified as Oriental were Chinese.

The data showed that from ages 15 to 79, 37 percent of 1,744 Oriental men and 58 percent of 1,989 Oriental women in the sample were nondrinkers, compared with 16 percent of white men, 25 percent of white women, 24 percent of black men, and 42 percent of black women. These figures, although imprecise and quite dated, do not contradict popular impressions of the relative ranking between races in the degree of abstention from alcohol. What is needed, however, is a more recent and accurate way of ascertaining the magnitude of alcohol problems among Chinese Americans in the absence of a psychiatric epidemiologic survey.

National Death Certificate Data for 1979-1981

NCHS compiles and manages data extracted from death certificates submitted by all 50 States. Although death certificates are required on a local level explicitly for legal purposes, they contain useful information for determining general trends in mortality and for conducting research on the causes of death. For purposes of this paper, the national mortality data are examined to obtain the death rates for chronic liver disease and cirrhosis specified as alcoholic.

Table 7 shows that, compared to white and black Americans, *Chinese have the lowest death rates per 100,000 population for chronic liver disease and cirrhosis specified as alcoholic*, regardless of whether the

Table 7.–Average annual age-specific[a] and age-adjusted (1940 U.S. standard) death rates[b] per 100,000 population for chronic liver disease and cirrhosis specified as alcoholic, by specified race, United States 1979-81

	Both sexes			Male		
Age	Chinese	White	Black	Chinese	White	Black
Crude rate	1.2	5.3	8.6	1.2	7.7	12.2
Age-adjusted rate	1.2	4.7	10.5	1.2	7.1	10.5
15-24	0	0	.2	0	.1	.3
25-34	.1	1.2	5.9	.2	1.8	7.9
35-44	.4	5.7	20.2	.6	8.2	30.4
45-54	2.4	13.5	31.4	3.2	19.3	46.6
55-64	2.2	17.1	26.9	2.7	25.7	40.1
65-74	4.6	14.2	15.7	6.1	23.7	26.1
75-84	6.9	5.7	5.7	8.4	11.1	10.8
85+	6.0	2.3	3.6	9.4	4.8	7.6

Source: National Center for Health Statistics, Division of Vital Statistics, unpublished data calculated by the authors.

[a] The numerator consists of 1979-81 cumulative number of deaths. The denominator is based on the total enumerated in the 1980 U.S. Census.

[b] Excludes deaths of nonresidents of the United States.

comparison is made for males only or for both sexes. (Data for females are extremely limited, making comparisons between ethnic groups difficult.) The age-adjusted death rate for this particular cause of death is 1.2 per 100,000 for Chinese males and females combined. The corresponding rates for white Americans is four times higher and for black Americans is nine times higher than the Chinese rate.

Among the male population alone, the white rate for chronic liver disease and cirrhosis specified as alcoholic is more than six times higher and the black rate is nine times higher than that found for Chinese Americans. For both sexes as well as for males, only in the highest age group–85 years or older–are the Chinese rates higher than the rates reported for white or black Americans. This higher rate at the oldest age group is misleading because it is based on an extremely small denominator for Chinese Americans, essentially an immigrant population characterized by more able-bodied young people than elderly.

In reexamining table 7, one notes that the peak age for deaths due to chronic liver disease and cirrhosis specified as alcoholic falls in the age groups 45-54 and 55-64 for black Americans. The peak age occurs somewhat later for white Americans (55-64 and 65-74) and even later for Chinese Americans (65-74 and 75-84). A digression on the significance of drinking among elderly Chinese seems necessary since this subject has been ignored altogether by several investigators who have conducted research on alcohol use, abuse, or alcoholism in Chinese or Chinese American populations.

Aging and Drinking in Chinese Culture: Chicago Pretest Data

Unlike modern and Western societies, in which social drinking is institutionalized and drinking excessively is used as a way of coping with life's stresses, alcohol consumption in Chinese folk society is sanctioned primarily for ceremonial or medicinal purposes. Historically, two broad categories of individuals are depicted as drinkers in Chinese classical literature and in daily life. The first group comprises the literati or gentry class, as mentioned earlier, for whom drinking occurs in the context of artistic composition. The second group is the elderly, for whom drinking is tolerated ostensibly for health reasons.

A cursory examination of the packaging of Chinese wines and a reading of Chinese medicine books provides ample evidence that in the folk culture, moderate drinking is believed to have medicinal effects, such as (1) increase of blood circulation, (2) treatment of anemia by increasing blood production, (3) expulsion of "wind," including relief from arthritis, (4) symptomatic relief from rheumatism, (5) improvement of appetite, (6) improvement of digestion, (7) improvement of complexion, (8) relief of exhaustion, and (9) maintenance of general well-being. These functions have been noted by Singer (1972) in his descriptive analysis of drinking in Hong Kong. However, the significance of drinking among elderly Chinese populations has scarcely been observed, much less studied. The exclusion of persons aged 65 or older from the Shanghai Psychiatric Epidemiologic Survey and the absence of drinking frequency data on the elderly Chinese population in the Taiwan study leave a void in our knowledge of the drinking patterns of elderly Chinese. How frequently do the elderly drink? What are their reasons for drinking? What are their reasons for stopping drinking altogether?

These questions were explored in a recent pretest study of cognitive impairment among a consecutive series of clients aged 50 or older who entered the Chinese American Service League in Chicago's Chinatown. Indeed, it was found that health is the reason that the elderly drink as well as the reason they stop drinking. Those who drink for health purposes reported the same kinds of reasons for drinking that have been transmitted in the folk culture for centuries. Those who used to drink but have now stopped drinking cited health reasons (mainly diabetes and heart trouble or shortness of breath).

Other pretest findings concerning drinking status by age and sex are presented in table 8. In the study population, lifetime abstention from alcohol decreases with increasing age. In the 50-64 age group, 59 percent of the Chinese elderly (N = 87) have never tasted alcohol, but among persons aged 80 and over (N = 31), only 45 percent have abstained from alcohol. The age trend observed in these data seems to be consistent with the age variation found for younger ages in the Shanghai study.

The sex difference in abstention is small, based on the results of the pretest study. Only 51 percent of older Chinese men, compared with 57 percent of older Chinese women, have never tasted wine or liquor. Proportionately, more women (26 percent) than men (21 percent) were ex-drinkers, leaving 17 percent of the women and 28 percent of the men as current drinkers. Although sampling bias and measurement errors are real problems in a small exploratory study, this changing ratio of sex differences in abstention from drinking deserves further study. It may well be that at younger ages Chinese women do not drink, but at older ages the social acceptability of drinking makes many of them drink moderately for health reasons.

In addition, 67 percent of the elderly interviewed reported that they flush whenever they drink. The proportion differs little by sex (67 percent for men and 66 percent for women). However, 26 percent reported that they can continue to drink despite the flushing, even though many can do so only with some difficulty.

Besides flushing, 38 percent of the elderly who drink reported that they experience other physical reactions. The proportion developing other physical reactions in addition to flushing is higher for men (43 percent) than for women (33 percent). Whether or not this finding is significant remains to be investigated. It suffices to say that only a beginning has been made in

Table 8.– Drinking status by age and sex

Age and	Never		No longer		Drinker		Total	
Sex	N	Percent	N	Percent	N	Percent	N	Percent
Age								
50-64	13	59.1	4	17.4	6	26.1	23	100.0
65-79	50	57.5	20	23.0	17	19.5	87	100.0
80-85+	14	45.2	9	29.0	8	25.8	31	100.0
Total	77	54.6	33	23.4	31	22.0	141	100.0
Sex								
Male	31	50.8	13	21.3	17	27.9	61	100.0
Female	46	56.8	21	25.9	14	17.3	81	100.0
Total	77	54.2	34	23.9	31	21.8	142	100.0

studying alcohol use, abuse, or alcoholism among Chinese American populations.

Discussion

There are two separate research questions concerning the use of alcohol among Chinese Americans. The first pertains to the relative magnitude of the consumption patterns of Chinese and Chinese Americans compared with other racial groups. The second deals with the relative change in quantity and frequency of alcohol consumption for Chinese and Chinese American populations in a given society at a given historical period. Both questions are too complex to be addressed fully in this paper.

With respect to the magnitude of consumption patterns, several related issues must be raised. The first has to do with drinking itself as a social process. Notwithstanding the likelihood of measurement errors in several of the epidemiologic data sets that have been reviewed here, the fact remains that, compared with white or black Americans, a large proportion of Chinese and Chinese Americans do not drink. The percentage of nondrinking Chinese men is high, though not so high as that of nondrinking women. If they drink at all, most Chinese would be considered occasional drinkers, even though the exact nature of these occasions is unclear. But, presumably, these occasions are celebrations and/or family reunions, such as weddings, birthdays, anniversaries, and public and religious ceremonies.

In studying Chinese and Chinese Americans, researchers have more often ignored the vast majority of nondrinkers and occasional drinkers and have attempted to count the number of frequent or regular drinkers. While this research makes sense epidemiologically, it makes little sense sociologically. Intuitively, it would seem more appropriate to pose questions on the importance of social change and drinking behavior. Given the data we have just reviewed, what factors are associated with the change of status from being a nondrinker to a drinker? The data indicate that perhaps two separate issues deserve further scrutiny: (1) that there is an interaction between age and gender at some point on the age continuum so that women have in fact shifted from a nondrinking status to that of drinking status as they got older, and men, especially older men, have had fewer restrictions in making the shift in status, even at younger ages; and (2) that rapid social change of norms brought on by economic and industrial prosperity in Chinese societies may be associated with the increasing use of alcohol by a growing proportion of the population, especially young males. Related to these two issues is another question. If drinking is cognitively associated with fun-seeking, tension-releasing, or so-called macho behavior (i.e., men prove or maintain their manhood by "holding their liquor"), what are the functional alternatives for women who drink in societies that disapprove of female drinkers or where large proportions of women drink?

We suspect that while drinking behavior is an expression of masculinity in many folk societies, childbirth and caring for children may be reflective of traditionally feminine behavior. In traditional societies where sex roles are well-defined and highly segregated, women would receive strong negative sanctions for assuming masculine roles, including drinking. If so, during rapid social change and rising economic prosperity, when masculine-feminine distinctions may become obscured as women fill traditionally "male" roles in the workplace, the frequency and quantity of female drinking may increase. Historically, the demographic literature has suggested that such changes are always accompanied by delayed median age at first marriage for women and lower fertility rates, which contribute to the concept of greater freedom for women to pursue work outside the home and more opportunities to assume masculine roles.

In a modern society, changes in social norms and family relationships may produce stress for both sexes, but more significantly for women than for men. Drinking may serve in this context as a modern coping behavior and an acceptable means of managing tensions. This would explain the rapid rise of alcohol consumption among the young in the United States, who experience the sharpest discontinuities in cultural values since they are most directly affected by rapid social change and economic prosperity. This situation appears to be happening in Taiwan today, where persons aged 18-24 (3.5 percent) have the highest lifetime prevalence of alcohol dependence of all age groups (Yeh and Hwu 1984) and a growing percentage of alcohol abuse (4.8 percent). In Shanghai, sweeping social changes are only now becoming evident, and we can expect a rise in the proportion of alcohol users and abusers there in the near future.

Certainly, insofar as other types of mental illness are concerned, psychiatric epidemiologic data collected in Taiwan during 1946-1948 and other data collected in 1961-1963, together with the most recent DIS study in 1982, suggest an increasingly large percentage of persons impaired by alcohol can be expected to accompany modernization. The Shanghai psychiatric epidemiologic data collected in 1983 show rates of mental disorders that are quite comparable to those found in Taiwan in the 1940s. Given the comparable stages of economic development of the two societies in the specified time periods, the mental illness rates, both in terms of intersociety comparison and in terms of Taiwan over time, led us to believe that there is a strong association between social change and stress that affects a person's psychological functioning. Drinking may be only one manifestation of such stress-induced behavior.

These facts led us to speculate that, as society undergoes sweeping social changes, there will exist a differential rate of increase in drinking among various segments of the general population. In other words, the probability of shifting from a nondrinking to drinking status will be different between genders and even for people in different educational and occupational strata. We hypothesize that for Chinese and Chinese Americans, the rate of shifting in frequency and quantity of drinking will be far greater for men than for women and far more substantial among men in the managerial, business, sales, and service sectors of the society. Members of these sectors are among the first to experience the rising purchasing power made possible by increasing economic prosperity. In mainland China, party functionaries can be expected to show a higher rate of increase in drinking, especially at the higher ends of the frequency continuum, because their jobs require them to be in touch with foreigners and visitors for ceremonial occasions.

On the other hand, the percentage of occasional drinkers will increase among those who are now experiencing a rapid increase in monthly income–the suburban farmers, who supply farm goods to a growing metropolis, and managerial, business, and sales people, whose very existence has been created by the new form of socialist economy in China. Our Shanghai data on drinking frequency by occupations already exhibit such trends.

When these changes do occur, it would be interesting to investigate the changes in the limited Chinese vocabulary for wine, *jiu*, which includes beer, wine, and hard liquor–and *who* drinks *how much* of *what* most frequently. This paper provides but the first attempt to ascertain the drinking patterns for Chinese populations in different societal contexts.

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An Epidemiological Survey of Alcohol, Drug, and Mental Health Problems in Hawaii: A Comparison of Four Ethnic Groups

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Abstract

A statewide epidemiological survey was conducted in Hawaii to guide the State's Department of Health, Mental Health Division, in its planning. The sampling design involved a two-stage cluster sampling procedure within each of the eight mental health catchment areas in Hawaii. A sample comprising 2,503 individuals aged 18 and older was obtained, yielding a significant proportion of Caucasians (28.5 percent), Japanese (21.6 percent), Filipinos (11.4 percent), and Native Hawaiians (18.9 percent). A structured inperson interview was conducted with each respondent to elicit information on individual alcohol consumption, problems related to drinking, drug use, psychiatric symptomatology, and other correlates of alcohol use.

This paper examines the rate of alcohol use and abuse, the extent of alcohol consumption, and correlates of alcohol consumption among four ethnic groups in Hawaii. The findings of this study indicate that the percentage of Native Hawaiian drinkers, although lower than that for Caucasians, exceeds the percentage of Japanese and Filipino drinkers. Moreover, Native Hawaiians consume less alcohol than Caucasians but more than other ethnic groups such as the Japanese and Filipinos. These findings are supported by previous studies conducted in Hawaii. A similar pattern was also found with problems related to alcohol consumption. Barriers to seeking professional help were reported by each ethnic group. A higher percentage of Native Hawaiians, Japanese, and Filipinos reported barriers than did Caucasians. This finding is consistent with previous studies. Discussions on the utilization of traditional treatment facilities as well as culturally appropriate services are presented.

Introduction

Since 1981, the Department of Health, Mental Health Division, of the State of Hawaii has been committed to providing a wide spectrum of services based on the needs of the State. Although there have been other statewide household surveys on alcohol use and abuse (Wilson et al. 1978; State of Hawaii 1979), a comprehensive survey was initiated recently to investigate not only the extent of substance use, but also the extent of mental health and psychosocial problems experienced by individuals.

This statewide survey was conducted in 1984 as a collaborative effort between the University of Hawaii, School of Public Health, and the Hawaii Department of Health, Mental Health Division. The survey contained items on alcohol and drug use and abuse, positive and negative affect, degree of satisfaction with a variety of life domains, knowledge as well as utilization of a variety of community service programs, and barriers to seeking professional help.

This paper provides estimated prevalence rates of alcohol use and abuse for the State of Hawaii as well as for selected demographic groups. Comparisons are made for the major ethnic groups in the State: Caucasians, Native Hawaiians (including people of full-Hawaiian and Part-Hawaiian descent), Japanese, and Filipinos. In addition, the relation between the extent and amount of alcohol consumption with correlates such as psychiatric symptomatology, lifetime prevalence of drug use, and psychosocial measures among the ethnic groups is presented. Barriers to seeking professional help are presented for each ethnic group in addition to suggested methods of overcoming these barriers.

Method

Sampling Design and Procedure

The sampling design was a two-stage cluster sampling procedure within each of Hawaii's eight mental health catchment areas. The first stage involved the random selection of a minimum of 60 primary sampling units (PSUs) of nine households within census blocks for Oahu catchment areas and census enumeration districts for the neighbor islands. The second sampling stage involved contacting the households within the PSUs with one call back. The completion rate averaged approximately five households per cluster across the eight catchment areas.

The sample within each of the eight catchment areas consisted of a minimum of 300 households with a total statewide sample of 2,503 households. Only one individual per household was interviewed. The procedure for selecting household members maximized the likelihood of obtaining adequate representation from both sexes and was limited to adults aged 18 and over. Children and youth, the homeless, institutionalized individuals, people who spoke limited English such as immigrants, and military personnel living on base were excluded from the selection process.

Interviews were conducted by using a structured survey instrument, consisting of items on alcohol consumption, drinking problems, drug use, psychiatric symptomatology, and other correlates. The total interview time took an average of 1 hour. The respondents were given an answer booklet where they could respond to the survey questions confidentially in order to encourage a high degree of self-disclosure.

Instrumentation

Alcohol measures. Two basic measures of alcohol use were employed. The first measure was a self-categorization of drinking behavior based on whether the respondent was a nondrinker (abstainer or former drinker); a recovering alcoholic; a light, moderate, or heavy drinker; or an alcoholic. The second measure was an alcohol consumption index obtained by multiplying the total quantity of drinks by the frequency of use, and the ethanol content of a standard serving for six types of alcoholic beverages: light beer (3.36 percent), regular beer (3.69 percent), champagne (9.2 percent), wine (9.9 percent), mixed drinks (36 percent), and liquor (36 percent) (Pennington and Church 1980). Respondents were asked to indicate the frequency of drinking the six types of alcoholic beverages with responses that ranged from "never" to "often" (e.g., every 3 to 4 hours). The quantity of drinks per occasion was determined by asking the respondents how many drinks they consumed of each type of alcoholic beverage. The responses ranged from "none" to "10 or more."

Alcohol-related problems were measured by the Short Michigan Alcohol Screening Test (SMAST) (Selzer et al. 1975) and a checklist of cognitive and physical effects of drinking. Respondents were asked to list any of the effects that either had occurred or were still occurring. The effects ranged in severity from "flushing, blushing, turning red" to "vomiting blood."

Mental health status. Five of the nine symptom dimensions of the Hopkins Symptom Checklist (SCL) were utilized to measure the mental health status of the respondents (Derogatis et al. 1974). The five dimensions were somatization, anxiety, depression, obsessive-compulsive, and interpersonal sensitivity. The respondents were asked if any of the symptoms occurred within the past 7 days and to rate the degree of bother or distress. The responses ranged from "no problem or feeling" to "extreme bother or distress." The Global Severity Index (GSI), one of the three global indices, was used as a measure of level or depth of symptomatic distress experienced by the individual (Derogatis 1977). The five dimension scores were arrived at by summing the distress scores within each dimension and then dividing each summed distress score by its respective number of items.

Drug use measures. Of the 19 drugs covered in the survey, only 10 are included in this report: marijuana/hashish, tranquilizers, barbiturates, LSD, PCP, methadone, cocaine, amphetamines, heroin, and morphine/

codeine/Percodan/Demerol. Respondents were instructed to state the frequency of using these drugs with a range of "never" to "use several times a day."

Psychosocial measures. To assess the quality of the respondents' social climate in their family and work environments, four items from four subscales of Moos's Family Environment Scale and Work Environment Scale were utilized (Moos et al. 1974). The four subscales utilized from the Family Environment Scale were designed to measure cohesion, expressiveness, conflict, and independence. The Family Relationship Dimension (FRD) consisted of the cohesion, expressiveness, and conflict subscales and was used as a general index of family support. From the Family Environment Scale, respondents were asked, "How often do members fight in your family/household?" and, "Is there a feeling of togetherness in your family/household?" The Work Environment subscales were designed to measure peer support, involvement, staff support, and autonomy. The Work Relationship Dimension (WRD) consisted of the peer support, involvement, and staff support subscales. Items from the Work Environment Scale included such questions as, "How often is the work really challenging?" and "How often is there a lot of group spirit?" The respondents were asked to rate each statement from the Family and Work Environment Scales on the frequency of occurrence within the last month. The responses ranged from "never" to "always." The subscale and dimension indices were computed by summing across the items.

Critical life events that respondents may have been experiencing were assessed using the Social Readjustment Rating Scale (Holmes and Rahe 1967), where the total number of critical life events experienced in the past year was obtained. Recent evidence indicates that negative events are more strongly related to personal distress than events requiring life change in general. In this report, however, positive events are included since it has been suggested by some researchers that alcohol consumption may be associated with positive events (Johnson et al., in press). A modified version of Phillips' Social Participation items was used to measure the extent of each respondent's participation and involvement with others (Phillips 1967*a,b*).

Sociodemographic measures. A variety of sociodemographic measures were obtained, such as employment status, occupation, mobility, education, income, total number of individuals living in the household, marital status, age, sex, and ethnicity. Only a portion of the sociodemographic measures, however, are discussed in this paper.

Results

Demographic Characteristics of the Sample

The demographic breakdown of the study sample is shown in table 1, which also contains selected demographic figures from the Department of Health, Health Surveillance Program. The population percentages obtained from the Health Surveillance Program were adjusted for the calendar year 1982 from the 1980 census data. Compared with the Health Surveillance Program data, the present household survey included more females, fewer single persons, fewer Japanese, and more persons from "Native Hawaiian" and "other or mixed" ethnic backgrounds. The age distribution of the household survey sample was similar to that of the Health Surveillance Program survey.

A large proportion of the Native Hawaiians were between the ages of 18 and 34. The Caucasian group represented a wider age distribution, with over 70 percent of the males and females between the ages of 18 and 54. The age distribution for the Japanese group represented a relatively even distribution. The proportion of Filipino males decreased slightly with increasing age, while a large proportion of the Filipino female respondents were aged 18-54. The Filipino group had the highest proportion with less than a high school degree, while the Caucasians had the lowest proportion with less than a high school degree. Compared with the other groups, a larger proportion of the Caucasian group either attended or graduated from college.

Prevalence rates. Point prevalence rates were estimated for the State as well as for the four major ethnic groups (i.e., Native Hawaiians, Caucasians, Japanese, and Filipinos) to determine whether there were significant differences among these ethnic groups in their use or abuse of alcohol. In addition, psychosocial factors were correlated with alcohol consumption measures to determine possible relationships. Associations between alcohol consumption, psychiatric symptomatology, and lifetime prevalence of drug use were examined for trends.

The alcohol consumption index was used to derive the four classifications of drinkers that are similar to

Table 1.—Comparison of household survey sample with State of Hawaii adult population, in percent

Characteristic	1982 health survey[a]	Household survey
Sex		
Male	50.5	43.1
Female	49.5	56.4
Marital status		
Married	64.0	65.2
Single	23.6	19.3
Widowed	5.5	6.2
Divorced	5.6	6.8
Separated	1.1	2.2
Ethnicity		
Native Hawaiian	14.7	18.9
Caucasian	29.0	28.5
Japanese	26.3	21.6
Filipino	11.5	11.4
Chinese	5.4	3.7
Black	1.0	–
Korean	2.1	.8
Samoan	.7	.7
Puerto Rican	.8	–
Others/mixed	8.4	14.3
Age groups		
18-24	17.8	17.0
25-34	26.8	23.9
35-44	16.8	19.1
45-54	14.2	13.0
55-64	12.9	14.7
65+	11.5	12.3
N	(11,517)	(2,503)

[a] Population data obtained from State of Hawaii, Department of Health, Health Surveillance Program.

those found in Clark and Midanik (1982): nondrinkers reportedly drank less than once a year and included former drinkers and teetotalers, light drinkers drank between 0.01 and 76.7 ounces of alcohol during the year, moderate drinkers drank from 76.7 to 361 ounces of alcohol in a year, and heavy drinkers drank more than 361 ounces of alcohol in a year.

Estimated point prevalence rates were computed for each of the four classifications of drinkers. Table 2 presents the statewide point prevalence rates of alcohol consumption as well as point prevalence rates within selected demographic subgroups. Within Hawaii, there were approximately 44.4 percent nondrinkers, 26.7 percent light drinkers, 19.8 percent moderate drinkers, and 9.1 percent heavy drinkers. Among the four major ethnic groups, drinking prevalence rates for Native Hawaiians and Caucasians consistently exceeded those of the Japanese and Filipinos as well as the statewide rates in the light, moderate, and heavy drinker classifications. The rates for males were higher than those for females in the moderate and heavy classifications. Rates for single and separated or divorced individuals in the moderate and heavy drinker classifications were higher than rates for the married and widowed. Rates for the 18-34 and 35-54 age groups exceeded the statewide rates within the moderate drinker group. Within the heavy drinker group, prevalence

Table 2.—Prevalence rates of alcohol consumption classifications within selected demographic subgroups, in percent

Characteristic	N	Nondrinkers	Light	Moderate	Heavy
Statewide	2,499	44.4	26.7	19.8	9.1
Ethnicity					
Native Hawaiian	472	40.7	27.7	20.6	11.0
Caucasian	713	31.0	29.0	26.4	13.6
Japanese	540	58.5	22.8	13.5	5.2
Filipino	285	53.0	25.3	15.1	6.7
Marital status					
Married	1,632	44.7	28.7	18.5	8.0
Single	482	40.5	24.3	25.1	10.2
Separated/divorced	224	33.5	24.6	24.1	17.9
Widowed	155	69.0	14.8	10.8	5.8
Sex					
Male	1,078	35.8	24.9	25.7	13.6
Female	1,412	50.9	28.1	15.2	5.8
Age					
18-34	686	35.1	30.9	23.8	10.2
35-54	672	41.5	28.0	21.3	9.2
55-64	309	53.4	20.1	14.6	12.0
65+	260	63.1	16.5	11.2	9.2

rates for each of the age groups exceeded that of the State, with the 55-64 age group reflecting the highest rate. Thus, from the prevalence rates presented in table 2, Native Hawaiians, Caucasians, separated/divorced individuals, and males are contributors to the high rate of alcohol consumption.

In examining the respondents' self-categorization of their present drinking behavior, only a small percentage described themselves as being alcoholics (0.3 percent) or heavy drinkers (1.4 percent). In addition, 42.6 percent of the respondents described themselves as nondrinkers, 36.8 percent as light drinkers, and 16.9 percent as moderate drinkers.

The respondent's self-categorization of present drinking behavior was compared with the constructed drinker classifications based on the total ounces of alcohol consumed in a year. Only 38.2 percent of the nondrinkers accurately categorized themselves. Of those who described their drinking behavior as light, only 18.9 percent were classified as light drinkers based on the total ounces of alcohol they consumed, while 12.6 percent consumed moderate amounts of alcohol. Of those who categorized themselves as moderate drinkers, 6.2 percent consumed moderate amounts of alcohol, while 6.2 percent consumed heavy amounts of alcohol in a year. It is not surprising that drinkers tend to conservatively categorize their drinking behavior.

Table 3 presents a breakdown of each ethnic group by sex with its present alcohol consumption classifications. At least 67 percent of the females within each of the ethnic groups were either nondrinkers or light drinkers. The Japanese and Filipino groups had higher percentages of nondrinkers than the Native Hawaiian and Caucasian groups, while the reverse is true for light drinkers. The percentage of females who drink heavily was higher for the Caucasian (9.1 percent) and Native Hawaiian groups (8.2 percent) than for the other two. Although over 50 percent of the males within each ethnic group were nondrinkers or light drinkers, a fairly large proportion of moderate and heavy drinkers was found, especially within the Native Hawaiian and Caucasian groups.

Table 4 presents the comparison between present alcohol consumption classifications with problem drinkers as measured by the Short Michigan Alcohol Screening Test within each of the four ethnic groups. As

Table 3.–Alcohol consumption classifications by ethnicity and sex, in percent

Consumption classification	Native Hawaiian		Caucasian		Japanese		Filipino	
	Male	Female	Male	Female	Male	Female	Male	Female
Nondrinker	33.5	44.9	27.7	33.9	45.0	68.5	36.0	66.7
Light drinker	23.9	30.3	23.6	33.9	23.8	22.0	32.0	19.5
Moderate drinker	26.7	16.7	30.1	23.1	20.8	8.2	21.6	10.1
Heavy drinker	15.9	8.2	18.6	9.1	10.4	1.3	10.4	3.8
N	(176)	(294)	(339)	(372)	(231)	(305)	(125)	(159)

indicated, 45.7 percent of the 471 Native Hawaiian respondents are problem drinkers according to the SMAST. Of these, only 5.3 percent are presently nondrinkers, while 14.7 percent and 8.5 percent are moderate and heavy drinkers, respectively. Of the 713 Caucasian respondents, 62.2 percent are problem drinkers; moreover, 22.7 percent and 11.4 percent are still drinking moderate and heavy amounts of alcohol. Less than a third of the Japanese (30.8 percent) and Filipino (31.7 percent) groups are problem drinkers. Of the 30.8 percent of the Japanese group who are problem drinkers, 10.2 percent are presently drinking moderate amounts of alcohol, and 3.7 percent are presently heavy drinkers. The Filipino group, with 31.7 percent problem drinkers, has 8.8 percent who are presently moderate drinkers and 6.0 percent who are heavy drinkers. Despite experiencing alcohol-related problems with either their families or the law, a fairly large proportion within each of the ethnic groups continues to consume large amounts of alcohol, especially within the Caucasian and Native Hawaiian groups.

Cognitive and physical symptoms related to alcohol consumption are presented in table 5 for each of the ethnic groups. In comparing the four ethnic groups, less than half of the Japanese group reportedly had experienced or were experiencing the symptoms on the checklist. Only 32.4 percent of the Caucasian group reported that none of the symptoms applied to them. Of the Native Hawaiian group, approximately one-fourth reported problems with feeling sick and throwing up (23.3 percent), headaches (22.7 percent), and weight gain (22.3 percent). About one-third of the Caucasian group reported feeling sick and throwing up (37.7 percent), headaches (33.9 percent), and problems with walking or balance (29.3 percent). The Japanese group reported flushing, blushing, and "turning red" (18.9 percent) and headaches (15.4 percent). The Filipino group reported headaches (23.5 percent) and flushing, blushing, and "turning red" (16.5 percent) as problems. Problems with severe hangovers were reported by 17.2 percent of the Native Hawaiians and 28.3 percent of the Caucasians, while only 7.2 percent and 7.0 percent of the Japanese and Filipino groups, respectively, reported that problem.

Mean differences in alcohol consumption. In order to determine whether there are mean differences in alcohol consumption among the four ethnic groups, including sex differences, a 4 x 2 ANOVA was conducted on the alcohol consumption index with ethnicity and sex as main effects. Significant ethnic (F = 15.63, df = (3, 2000), $p < .001$) and sex (F = 44.14, df = (1, 2000), $p < .001$) differences were found. Thus,

Table 4.–Problem drinkers as measured by the SMAST and alcohol consumption classifications within four ethnic groups, in percent

Consumption classification	Native Hawaiian	Caucasian	Japanese	Filipino
Nondrinker	5.3	7.2	1.9	3.2
Light drinker	17.2	20.9	15.0	13.7
Moderate drinker	14.7	22.7	10.2	8.8
Heavy drinker	8.5	11.4	3.7	6.0
Total	45.7	62.2	30.8	31.7
N	(471)	(713)	(539)	(284)

Table 5.–Alcohol-related symptoms reported within four ethnic groups, in percent

Characteristics	Native Hawaiian	Caucasian	Japanese	Filipino
Flushing, blushing, "turning red"	16.1	16.8	18.9	16.5
Weight gain	22.3	17.8	11.7	13.3
Feeling sick, throwing up	23.3	37.7	14.4	13.7
Severe hangovers	17.2	28.3	7.2	7.0
Shakes	2.1	5.3	.9	1.1
Blackouts	2.8	8.0	1.5	2.5
DTs	.4	1.5	.2	.7
Nightmares or fright	1.1	2.0	.6	.4
Problems with vision	8.3	10.0	1.9	4.9
Problems with walking or balance	18.9	29.3	10.9	11.6
Dizziness	11.4	21.6	7.8	11.6
Problems with memory	11.0	12.5	4.1	6.0
Headaches	22.7	33.9	15.4	23.5
Numbness in hands or feet	1.7	2.8	1.5	2.1
Confusion, inability to think straight	10.2	19.6	5.2	4.6
Vomiting blood	.6	1.0	.4	0
Liver trouble	1.3	1.0	.2	.4
Stomach or ulcer trouble	2.5	2.0	1.3	1.1
Other medical problems	.9	2.5	.7	1.4
None of the above	44.5	32.4	60.7	58.6
N	(472)	(713)	(540)	(285)

males ($\overline{X}$ = 204.48, sd = 458.52) reportedly consume significantly more alcohol in a year than do females ($\overline{X}$ = 89.73, sd = 321.73).

In order to determine interethnic differences, Scheffe's test on mean differences was utilized. The findings indicate that the Caucasian ($\overline{X}$ = 205.2, sd = 511.96) and Native Hawaiian ($\overline{X}$ = 156.01, sd = 415.28) groups were not significantly different from one another; however, both groups were significantly different from the Japanese ($\overline{X}$ = 71.68, sd = 05.72) and Filipinos ($\overline{X}$ = 74.29, sd = 176.24). In computing mean differences among the ethnic groups, the harmonic mean was utilized to account for the unequal sample sizes for each of the ethnic groups, thus increasing its conservativeness.

Correlates of alcohol consumption. The associations of alcohol consumption with the five symptom dimension scores of the SCL and the Global Severity Index score were also examined.. Weak but significant positive correlations were found between alcohol consumption with the anxiety dimension for the Caucasian group ($r = .08$, $p < .01$) and the depression dimension for the Japanese group ($r = .10$, $p < .01$). This trend suggests a possible positive relationship between the symptomatology for these dimensions within the ethnic group and alcohol consumption. Although no cause-effect relationship can be derived from correlational data, the trends suggested by the data indicate a need for further inquiry in determining cause-effect relationships between alcohol consumption and psychiatric symptomatology within various ethnic groups.

Examination of the association between alcohol use and the utilization of drugs was of interest in identifying the proportion of polydrug users within each of the ethnic groups. The Caucasian group reported the highest lifetime prevalence rates of drug use, with Native Hawaiians reporting the next highest lifetime prevalence rates. The Caucasians also reported the highest combined use of drugs and alcohol, followed by Native Hawaiians. The proportion of Japanese and Filipino individuals utilizing drugs was relatively low. This finding suggests a higher health risk from alcohol and drug use for the Caucasian group since the combination of alcohol with some drugs may lead to fatal consequences.

In investigating the association between psychosocial variables and alcohol consumption, Pearson correlations were conducted. The correlation coefficients, in general, reflected weak associations between alcohol consumption and Moos's subscales for family and work environments, as well as weak associations with some of the psychosocial variables. The total number of critical life events, whether positive or negative, had no relation to the amount of alcohol consumed for all of the ethnic groups. Social participation was related to alcohol consumption. For the Caucasian group, the number of organizations in which one is active is negatively correlated with alcohol consumption, whereas the number of visits in either the respondent's home or a friend's home is positively correlated with alcohol consumption. For the Native Hawaiian group, only the number of visits in the home is positively correlated with alcohol consumption. For the Japanese, the number of social activities in which they participated is positively correlated with alcohol consumption. The Filipino group also showed a positive relation between participation in social activities and alcohol consumption.

Barriers. Barriers that respondents identified to seeking professional help for a personal alcohol problem as well as alcohol problems of family members are presented in table 6. Personal shame and embarrassment were expressed by more Japanese (26.9 percent), Native Hawaiians (24.2 percent), and Filipinos (23.5 percent) than by Caucasians (19.1 percent). Native Hawaiians (20.8 percent) cited shame and embarrassment as a barrier if their family or friends knew, while only 13.7 percent of the Filipinos expressed this as a barrier. In addition, 18.6 percent of the Filipinos, 11.7 percent of the Native Hawaiians, and 12.6 percent of the Japanese did not know where to go for a personal alcohol problem. On the other hand, over half of the Caucasians (64.9 percent), Japanese (53.5 percent), and Native Hawaiians (51.1 percent) said they would definitely seek professional help, but only 42.5 percent of the Filipinos expressed this willingness.

It is interesting to note that if a family member has an alcohol problem, a larger percentage of the respondents would definitely seek professional help. Over 75 percent of the Caucasians, 68.3 percent of the Japanese, and 66.3 percent of the Native Hawaiians did not indicate any barriers to seeking professional help in this situation, while 57.2 percent of the Filipinos would seek help. Only a small percentage of the Caucasians reported that "It would upset my family/friends if I tried to help" (6.9 percent) and "It is none of my business" (5.1 percent). A small proportion of Native Hawaiians reported that it would upset their family if they tried to help (11.0 percent), and a few others did not know where to go (7.4 percent) or felt it was none of their business (8.1 percent). The barriers most frequently stated by Filipino and Japanese groups were that they did not know where to go (13.3 percent and 8.5 percent, respectively) or felt it would upset their family or friends if they tried to help (6.7 percent and 8.2 percent, respectively).

Discussion

Ethnic comparisons of the extent of alcohol consumption were presented according to two different measures. One measure, in the form of estimated prevalence rates, was used to examine the differential proportions of respondents in each drinking classification for the four ethnic groups. Another measure, the mean consumption of alcohol, was compared for the ethnic groups to identify any significant differences in consumption.

Prevalence Rates

Comparisons of Hawaii's rates with national rates are of interest. Clark and Midanik (1982), in reporting the results of the 1979 national survey, presented the national rate of heavier drinkers as 9 percent; in the present study, the prevalence rate of heavy drinkers is 9.1 percent. Although the methodologies were different, the estimated rate of heavy drinkers in the State of Hawaii is equivalent to the national rate. National rates for light and moderate drinkers are slightly higher than Hawaii's rates. The present study also found a higher rate of nondrinkers than that reported in the 1979 national survey; however, this difference is probably due to the inclusion of infrequent drinkers, who drink less than once a year, in the present study.

High rates of alcohol consumption in Hawaii were found among males, Caucasians, Native Hawaiians, single and separated or divorced persons, and younger age groups (18-34 years old). Other national and statewide epidemiological studies (Clark and Midanik 1982; State of Hawaii 1979; Fitzgerald and Mulford 1981; Malin et al. 1982) have reported similar findings. As expected, alcohol consumption among males is higher than among females in the moderate and heavy drinking categories. Higher rates among younger age groups have also been consistently reported in the literature. In addition, reports of ethnic differences

Table 6.—Barriers to seeking professional help for alcohol problems within four ethnic groups, in percent

	Personal alcohol problem(s)				Alcohol problem of a family member			
Barriers	Native Hawaiian	Caucasian	Japanese	Filipino	Native Hawaiian	Caucasian	Japanese	Filipino
I don't know where to go.	11.7	6.0	12.6	18.6	7.4	3.8	8.5	13.3
Agency/service is too far away.	1.5	2.2	2.0	2.8	.6	.7	.7	.7
Agency/service is too expensive.	5.9	5.3	2.6	5.3	1.3	1.8	1.7	4.6
I would be personally ashamed or embarrassed.	24.2	19.1	26.9	23.5	3.8	3.5	4.3	4.9
I would be ashamed or embarrassed if my family or friends knew.	20.8	15.7	18.5	13.7	5.1	3.4	5.0	5.3
I would upset my family/friends if I tried to help.	4.9	3.1	5.6	7.7	11.0	6.9	8.2	6.7
It is none of my business.	.9	.7	.9	2.5	8.1	5.1	3.9	4.6
I don't think this problem can be helped by professionals.	5.1	4.9	2.6	4.2	1.5	1.5	1.5	3.2
Professionals from my own cultural or ethnic group not available.	1.1	.8	.2	4.6	.6	.4	.6	1.8
None of the above reasons, I would definitely seek professional help.	51.1	64.9	53.5	42.5	66.3	76.9	68.3	57.2
I don't wish to answer this question.	5.3	3.9	5.9	8.4	5.9	4.1	5.2	7.4
N	(472)	(713)	(540)	(285)	(472)	(713)	(540)	(285)

(Johnson et al., in press) have consistently cited higher alcohol consumption rates among the Caucasians in comparison with ethnic groups such as the Japanese. Epidemiological studies on the extent of alcohol consumption of Native Hawaiians have been extremely sparse. In examining the prevalence rates of drinking categories among the four ethnic groups, Native Hawaiians have higher rates in the moderate and heavy drinking categories than the Japanese and Filipinos, but fall below the rate of the Caucasians.

It is interesting to note that despite problems experienced with families, employers, or the law, a fairly large proportion of individuals within each of the ethnic groups continues to consume moderate to heavy amounts of alcohol. This is a problem, particularly for the Caucasian and Native Hawaiian groups. In addition, more Caucasians and Native Hawaiians have experienced cognitive and physical symptoms related to their drinking. It would be of interest to investigate the circumstances surrounding continued consumption subsequent to experiencing these problems.

Mean Consumption

The mean alcohol consumption for the Native Hawaiians was not significantly different from the Caucasian group; however, both of these groups were significantly different from the Japanese and Filipino groups. This finding indicates that Native Hawaiians are similar to Caucasians in the extent of alcohol consumption; however, Native Hawaiians may be at equal or greater risk of alcohol abuse than the Caucasians since they are less inclined to seek professional help, especially if they have a personal alcohol problem. Native Hawaiian and Caucasian groups seem to experience similar psychosocial problems and cognitive and physical symptoms relating to alcohol. Moreover, both groups have a relatively high proportion of individuals who are presently moderate or heavy drinkers despite having experienced alcohol-related problems.

Correlates of Alcohol Consumption

Although the correlations were extremely low between alcohol consumption and the Hopkins Symptom Checklist dimensions, the family and work environment scales, and other psychosocial variables, they suggested possible ethnic trends. For example, Caucasians may drink more when feeling anxious or during social visits in their own homes or the homes of friends. The Japanese may drink more when feeling depressed and during increased levels of social activity. Filipinos, on the other hand, may drink more without experiencing the accompanying psychiatric problems, but the relationship between alcohol consumption and the number of social activities for this group is weak.

Earlier research supports the findings of this study that Native Hawaiians appear to consume less alcohol than Caucasians but more than other ethnic groups such as the Japanese and Filipinos (Wilson et al. 1978; State of Hawaii 1979; Stinson 1984). Moreover, the present study, utilizing a conservative statistical posttest to examine mean differences among ethnic groups, found that the difference between the Caucasian and Native Hawaiian groups was not statistically significant, but these two groups differed significantly from the Japanese and Filipino groups. One could surmise from this finding that the Caucasians and Native Hawaiians are similar in their extent of alcohol consumption, placing them at equal risk for alcohol-related problems. In addition, the barriers presented in this report indicate that only slightly over one-half of the Native Hawaiians would seek professional help, while a fair proportion (64.9 percent) of the Caucasians would seek professional help. However, other researchers have pointed out that Native Hawaiians (Stinson 1984) and Asian Americans (Kitano 1982) are underserved in alcohol treatment facilities; they do not routinely seek professional help for alcohol-related problems; and, when they do seek help, they tend to go to family and/or friends rather than utilize traditional treatment services. In addition, the Native Hawaiians have relatively more recidivists and resist treatment until they are at a stage of complete alcohol dependence.

Implications and Future Research

From the present study, several implications for prevention and treatment services can be drawn. Among the non-Caucasian groups, Native Hawaiians have the highest risk of alcohol abuse based on the extent of their use of alcohol, their underutilization of traditional treatment services, and their degree of recidivism. Presently, there are only three agencies in Hawaii that provide culturally appropriate services to Native Hawaiians–Waianae Rap Center, Alu Like's Hale Ola o Hoopakolea, and a subgroup of Alcoholics Anonymous called the Malia group. Aside from these three agencies, on Oahu, other alcohol treatment facilities in the State utilize traditional Western treatment services, and a majority of the service providers are Caucasian, with a minimal number of non-Caucasian service providers. Thus, it appears that more services to the Native Hawaiians are needed statewide to deal with alcohol problems.

Although alcohol problems among Asian American groups are not as extensive as those of Caucasians or Native Hawaiians, culturally appropriate treatment and prevention services are still needed for those who are consuming large amounts of alcohol daily. Similarly, with the Malia group, a modified version of Danshukai, Japan's version of Alcoholics Anonymous (Kitano 1982), could be developed for Hawaii's Japanese groups. In addition, since the family unit of Asian American groups is assumed to be important, family members could actively participate in the treatment process; however, they would need to receive educational and informational services.

In addition to more treatment and prevention facilities, additional research with Native Hawaiian and Asian American groups is in order. The research should not only be concerned with the incidence and prevalence of alcohol use among these ethnic groups, but should also include indepth examinations of questions such as attitudes towards drinking and treatment facilities; reasons for continued drinking despite work, family, and legal problems; recidivism rates for each group; and the extent of the alcohol problem upon admission to treatment facilities.

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Alcohol Consumption Patterns Among the Five Major Ethnic Groups in Hawaii: Correlations with Incidence of Esophageal and Oropharyngeal Cancer

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ABSTRACT

Ethnic differences in drinking habits were examined among the five major ethnic groups in Hawaii (Caucasians, Japanese, Chinese, Filipinos, and Native Hawaiians) using interview data collected between 1975 and 1980 from a representative sample of approximately 50,000 Hawaii residents. Native Hawaiians had the highest consumption of beer, and Caucasians had the highest consumption of wine and spirits. Overall, total ethanol intake was similar for these two ethnic groups and was considerably higher than the intake among the three Asian groups. This pattern was observed when either daily or lifetime use of alcohol was compared and was rather consistent between sexes and age groups. Alcohol use was not remarkably prevalent among Native Hawaiians; however, Native Hawaiians who drank tended to consume more ethanol than drinkers in the other groups. Weekly drinking patterns were very similar among races and did not suggest that binge or regular drinking was more likely among any particular group. Correlations of these consumption data with some race-specific cancer incidence rates showed that alcohol intake patterns in Hawaii explain well the ethnic variation in the incidence of oropharyngeal cancer. However, alcohol intake patterns do not adequately account for the variation in rate of esophageal cancer. This discrepancy did not appear to be due to differences in other known risk factors for esophageal cancer, such as smoking or low consumption of fruits and vegetables.

Introduction

In the past several decades, epidemiologic studies have linked the consumption of alcoholic beverages, especially among smokers and malnourished individuals, with the development of cancers at various sites, including the esophagus, mouth, pharynx, larynx, and, possibly, liver and rectum (National Research Council 1982). However, there is still little known about the mechanisms through which alcohol consumption contributes to cancer risk. It is unclear whether ethanol per se, which is not a carcinogen in animals, plays a role either directly, by activation of carcinogens through enzymatic induction, or indirectly, by acting as a cofactor of associated nutritional deficiencies. It is also unclear whether other carcinogenic constituents of specific alcoholic beverages, such as certain beers or brandies, are solely responsible for this increased risk. Therefore, detailed epidemiologic studies of drinking habits among high-risk populations are needed to clarify these relationships.

Certain aspects of cancer morbidity in relation to alcohol consumption are of public health importance in Hawaii. Native Hawaiians have an incidence rate of esophageal cancer that is one of the highest in the nation, third only to that of blacks and Puerto Ricans (Young et al. 1985). Yet their alcohol consumption is similar to that of Caucasians in Hawaii (Kolonel 1979), who have low esophageal cancer rates. Japanese, Filipinos, and Chinese, the other main ethnic groups living in Hawaii, consume relatively small quantities of alcohol and have intermediate rates for this cancer. Genetic factors are likely to play a minor role in these ethnic differences, since the incidence of esophageal cancer is known to vary widely within small geographic areas among communities with the same ethnic background (Day et al. 1982). Hawaiian Caucasians also have one of the highest rates in the country for cancer of the buccal cavity and pharynx, whereas Native Hawaiians have markedly lower rates for this cancer. This suggests greater specificity in the etiology of alcohol-related cancers or multifactorial causes.

Alcohol-related cancers are responsible for only a limited number of deaths every year in Hawaii because of the small size of the State's population. Still, these ethnic variations in cancer risk combined with differences in culturally determined environmental exposures (such as drinking, but also smoking and diet) are important because of the interesting potential they offer for cancer etiology and cancer prevention research. An additional advantage for such research results from the fact that potential confounders such as physical environment, access to health care, and medical practices are well-standardized in Hawaii compared with other settings.

In this report, lifetime and weekly drinking patterns are further characterized among Hawaii's main ethnic groups. An attempt is made to correlate these patterns with the incidence of several alcohol-related cancers in light of other recently recognized or suspected risk factors.

Methods

Since 1968, the Hawaii State Department of Health has been conducting a random 2 percent household survey to collect demographic and health-related data through personal interviews. From 1975 to 1980, the Epidemiology Program of the Cancer Research Center of Hawaii appended a special questionnaire on dietary, smoking, and drinking practices that was administered to all adults aged 18 and older. The questionnaire items on drinking determined whether individuals regularly consumed alcoholic beverages and, if so, the age at which they started to drink, the types of beverages (beer, wine, sake, or hard liquor), and, for each beverage, the number of days per week they drank and the average amount consumed per day.

The ethnic origin of the subjects was determined from that of their parents, which was coded as "pure" or as a combination of, at most, three races. The present analysis was restricted to individuals of pure extraction, with the exception of the Native Hawaiian group, which is heavily mixed. For the Native Hawaiian group, this racial classification on parentage allowed for some subgroup analyses by the degree of Hawaiian heritage claimed by the subjects.

Daily ethanol consumption was computed using Bowes' and Church's alcohol content estimates (Pennington and Church 1985), corresponding to a percentage of pure alcohol by volume of 40 percent for spirits, 12 percent for wine, and 5.5 percent for beer.

Because an objective of the survey was to relate alcohol use to some cancer incidence rates in Hawaii, mean alcohol consumption values were based on the experience of all individuals (drinkers and nondrinkers) in each sex-race group. The results, therefore, are presented for each of these groups as age-specific and age-adjusted (by analysis of covariance) means. However, to describe the data better, the distributions of these groups by level of ethanol intake were also compared. These distributions appeared to be heavily skewed by the presence of a great number of abstainers and a small number of abusers. Thus, the decision was made not to test for significant differences among these population means since the assumptions required for the usual parametric and nonparametric tests were not met. Furthermore, there was the likelihood that because of the large sample size, even trivial differences would be statistically significant. For some subgroup analyses, however, in which there was no reason to question the normality of the data, the unpaired Student's t-test was used to compare race-sex means.

The cancer rates used in this study were those generated by the Hawaii Tumor Registry, a population-based registry that is a member of the Surveillance, Epidemiology, and End Results (SEER) program of the National Cancer Institute. Since alcohol-related cancers are relatively rare, average annual incidence rates were computed for a 10-year period (1973-1982). All cancer rates were age-adjusted by the directed method to the 1970 U.S. population.

Results

Table 1 shows the distribution of the subjects by sex, race, and age. The relative distribution of this sample corresponds fairly well to that of the population

Table 1.—Distribution of the population sample by sex, age, and race, Hawaii, 1975-1980

		Race					
Sex	Age	Caucasian	Native Hawaiian	Japanese	Filipino	Chinese	Total
Male	18-29	2,264	1,211	1,431	736	188	5,830
	30-39	1,962	816	1,066	597	167	4,608
	40-49	1,090	573	1,072	451	162	3,348
	50-59	940	421	1,556	532	205	3,654
	60-69	713	274	1,078	640	171	2,876
	70+	362	133	631	481	118	1,725
	Total	7,331	3,428	6,834	3,437	1,011	22,041
	Percent	33.3	15.6	31.0	15.6	4.6	100.0
Female	18-29	2,506	1,425	1,404	812	235	6,382
	30-39	1,794	941	1,107	705	181	4,728
	40-49	949	662	1,394	591	169	3,765
	50-59	896	522	1,785	444	190	3,837
	60-69	687	311	1,040	210	180	2,428
	70+	393	158	710	149	131	1,541
	Total	7,225	4,019	7,440	2,911	1,086	22,681
	Percent	31.9	17.7	32.8	12.8	4.8	100.0

of Hawaii as estimated from other sources (i.e., 1980 census).

Table 2 presents the mean weekly consumption of beer for the five races by sex and age group. Native Hawaiians reported drinking more beer than the other races in a very consistent fashion across sexes and age groups. Beer consumption was also greater among Caucasian males than among Asian males. Most of the beer consumption differential between Japanese and Caucasian males occurred in the younger age groups since, after age 40, Japanese males reported drinking as much beer as did Caucasian males. Chinese subjects had the lowest mean beer consumption among males. Among females, beer consumption was much lower overall than among males, and most of the beer drinking by females occurred among Native Hawaiians and Caucasians.

Wine (table 3) and hard liquor (table 4) were mostly consumed by Caucasians in both sexes, with a trend toward increasing consumption with increasing age. A similar trend is discernible for hard liquor consumption among males of the other races and among Native Hawaiian and Chinese females. (Mean consumption of sake was low in all races and is not shown. Sake was consumed by only 1.1 percent of the Japanese males and less than 0.5 percent of the subjects in other race-sex subgroups.)

When these consumption data were converted into grams of ethanol (table 5), a similar ethnic pattern was observed. In both sexes, Caucasians reported the highest ethanol consumption, closely followed by Native Hawaiians. Japanese, Filipinos, and Chinese had markedly lower ethanol intakes. Compared with the Caucasians, the Chinese had an ethanol intake 3.5 times lower for males and 13.3 times lower for females. Ethanol intake was greater for males than for females and for the middle age groups than for younger and older groups.

The percentage of drinkers in each sex-race group is presented in table 6. Again, the same ethnic pattern of alcohol use was observed, with Caucasians most likely and Chinese and Filipinos least likely to be alcohol users. However, the proportions of drinkers among Native Hawaiian and Japanese males were very

Table 2.–Mean beer consumption (cans per week) by sex, race, and age among a representative population sample, Hawaii, 1975-1980

		Race				
Sex	Age	Caucasian	Native Hawaiian	Japanese	Filipino	Chinese
Male	18-29	5.9	5.9	3.3	2.6	1.3
	30-39	6.2	7.0	4.4	3.3	1.5
	40-49	5.1	6.8	5.3	3.5	1.7
	50-59	4.8	7.5	4.7	4.5	2.2
	60-69	3.0	6.3	2.9	1.7	2.1
	70+	1.6	3.7	1.4	.9	.8
	Age-adjusted					
	All	5.1	6.3	4.0	2.9	1.8
	≥45	3.7	6.2	3.8	2.9	2.0
Female	18-29	.9	.7	.1	.2	.1
	30-39	.8	1.1	.2	.1	0
	40-49	.7	1.3	.2	.1	0
	50-59	.4	1.3	.1	.1	0
	60-69	.6	1.0	0	.3	.1
	70+	.4	.6	0	.4	0
	Age-adjusted					
	All	.7	1.0	.1	.2	.1
	≥45	.5	1.2	.1	.2	.1

similar. The overall prevalence rates for alcohol found in this study were low compared with those found by others in Hawaii (Murakami 1985) and elsewhere in the United States (Malin et al. 1982). This is partly due to the fact that the survey questionnaire only identified regular alcohol drinkers (defined as consumers of at least one drink per week). Thus, the "abstainer" group included some "rare" and "occasional" drinkers.

The distribution of the self-reported drinkers by level of ethanol intake (table 7) indicates that Caucasians and, in particular, Native Hawaiians were more likely to report a high ethanol intake.

To check the homogeneity of the Native Hawaiian group with regard to alcohol consumption, the data were analyzed by the degree of Hawaiian heritage claimed by the subjects. Subjects were classified as "100 percent Hawaiian" if they reported that their parents were of unmixed Hawaiian descent. Other subjects were classified as "75 percent Hawaiian" if they reported that one of their parents was unmixed Hawaiian and the other was of two or more ethnic origins, one being Hawaiian. Finally, Part-Hawaiians were classified as "50 percent Caucasian" or "50 percent Chinese" if they reported one parent as being "pure Caucasian" or "pure Chinese," respectively, and the other unmixed Hawaiian. This classification is based on claimed Hawaiian heritage and should not be regarded as genetically exact. Nonetheless, it is probably satisfactory for studies of lifestyle and disease.

The results presented in tables 8 and 9 suggest that, among males, pure Hawaiians have the greatest consumption of beer and total alcohol; "50 percent Chinese" have the lowest. However, these differences in males were small, as were the differences in consumption observed among females. The distribution of these Native Hawaiians by ethanol intake level (table 10) confirms the similarity of their alcohol consumption patterns. Therefore, the grouping of Hawaiians and Part-Hawaiians together in studies of alcohol and health seems appropriate.

Figure 1 illustrates the weekly patterns of beer drinking for the five groups, based on the number of days a week the subjects drank beer in each sex and age (< 45, ≥ 45 years) category. Percentages were not plotted when fewer than 50 beer drinkers were included in one of those categories. A single, consistent

Table 3.–Mean wine consumption (glasses per week) by sex, race, and age among a representative population sample, Hawaii, 1975-1980

		Race				
Sex	Age	Caucasian	Native Hawaiian	Japanese	Filipino	Chinese
Male	18-29	0.7	0.1	0.1	0.2	0.1
	30-39	1.0	.4	.1	.1	.1
	40-49	1.1	.3	.1	.1	.2
	50-59	1.5	.3	.1	.4	.1
	60-69	1.4	.3	.2	.5	.3
	70+	1.1	.1	.4	.2	0
	Age-adjusted					
	All	1.0	.3	.1	.2	.1
	≥45	1.3	.3	.2	.3	.2
Female	18-29	.8	.2	.1	.1	.2
	30-39	1.1	.3	.2	.1	.2
	40-49	1.3	.3	.1	0	.1
	50-59	1.2	.2	.1	0	0
	60-69	.9	.2	.1	.2	0
	70+	.6	0	.1	0	.1
	Age-adjusted					
	All	1.0	.2	.1	.1	.1
	≥45	1.1	.2	.1	.1	.1

beer-drinking pattern, independent of race, sex, or age, emerges from the data presented in figure 1. In each panel the majority of beer drinkers reported drinking beer either 1 or 2 days a week (probably on the weekend) or all 7 days of the week. Proportionally, more males than females reported drinking beer on a daily basis. In general, these patterns of beer drinking were remarkably similar among races. The same general drinking pattern was observed with wine (figure 2) and hard liquor (figure 3), which were consumed on a daily basis by a greater proportion of older than younger adults.

Table 11 shows the mean age at which subjects started to drink alcoholic beverages. On average, males started drinking at an earlier age than females, and Caucasians and Native Hawaiians started drinking at an earlier age than members of the other groups. Among Native Hawaiians (table 12), males with increasing Hawaiian heritage tended to start drinking at an earlier age. However, none of the differences between overall means among Native Hawaiians or among races was statistically significant. In both sexes and among all races, the trend is to start drinking at an earlier age as the age at interview decreases. This trend is progressive and consistent across all age groups and, therefore, seems unlikely to be due only to a recall bias; however, this bias cannot be totally excluded. More probably, this pattern results from a cohort effect corresponding to the progressive increase in apparent per capita alcohol consumption (sales) recorded in the United States since the end of the Prohibition era (Malin et al. 1982).

Correlations of mean alcohol consumption with esophageal and oropharyngeal cancer incidence rates for the five major ethnic groups are presented in figures 4 and 5, respectively. Alcohol consumption data correlate better with the incidence rates for oropharyngeal cancer than for esophageal cancer. This difference is due to the fact that, for their alcohol intake levels, Caucasian males and, possibly, Caucasian females have lower incidence rates of esophageal cancer relative to the other ethnic-sex groups.

Table 4.—Mean hard liquor consumption (jiggers per week) by sex, race, and age among a representative population sample, Hawaii, 1975-1980

		Race				
Sex	Age	Caucasian	Native Hawaiian	Japanese	Filipino	Chinese
Male	18-29	0.9	0.5	0.3	0.4	0.1
	30-39	1.3	.6	.8	.5	.4
	40-49	2.3	.8	.6	.7	.5
	50-59	3.5	1.1	.7	.8	1.0
	60-69	3.2	1.0	.9	.8	.5
	70+	3.1	1.9	.4	1.4	.7
	Age-adjusted					
	All	2.0	.9	.5	.6	.4
	≥45	3.2	1.2	.7	.9	.7
Female	18-29	.4	.2	.2	.1	.1
	30-39	.7	.2	.1	.1	.1
	40-49	1.5	.5	.1	.4	.1
	50-59	2.1	.5	.1	0	.2
	60-69	2.5	.5	.1	0	.1
	70+	1.5	.4	.1	.1	.2
	Age-adjusted					
	All	1.1	.4	.1	.2	.1
	≥45	2.1	.5	.1	.2	.2

Table 5.–Mean ethanol intake (grams per day) by sex, race, and age among a representative population sample, Hawaii, 1975-1980

Sex	Age	Race Caucasian	 Native Hawaiian	 Japanese	 Filipino	 Chinese
Male	18-29	13.9	12.3	7.0	6.0	2.8
	30-39	15.7	14.7	10.0	7.5	3.9
	40-49	16.3	15.1	11.5	8.3	4.6
	50-59	18.8	16.9	10.6	10.9	6.3
	60-69	14.7	14.1	7.7	5.6	5.6
	70+	11.3	11.2	5.0	5.0	3.0
	Age-adjusted					
	All	15.4	14.1	8.9	7.1	4.4
	≥45	15.9	14.6	9.0	7.7	5.5
Female	18-29	3.7	2.2	.8	.8	.7
	30-39	4.6	2.8	.8	.4	.6
	40-49	6.6	3.9	.8	1.0	.4
	50-59	7.0	3.8	.7	.3	.6
	60-69	7.7	3.2	.3	.8	.4
	70+	5.0	1.9	.4	1.2	.6
	Age-adjusted					
	All	5.3	3.0	.5	.8	.4
	≥45	7.0	3.4	.6	.9	.6

To investigate the possibility that this discrepancy was due to differences in other known or suggested risk factors for esophageal cancer, the distribution of the subjects by smoking and drinking status was compared for each ethnic group, as well as by mean frequency of consumption of vegetables and fruits within smoking/drinking categories. The results do not suggest that Caucasians who drink alcohol are less likely to be smokers or are more likely to consume greater quantities of fruits and vegetables (potential protective factors [Mettlin et al. 1980]) than are alcohol consumers in the other ethnic groups.

Discussion

These data, collected from a large representative sample of Hawaii's population, confirm the ethnic differences in drinking practices observed in a preliminary analysis (Kolonel 1979), as well as in other studies (Murakami 1985). Overall, alcohol consumption is greatest among Caucasians and Native Hawaiians and is lowest among Chinese, while the alcohol consumption of the Japanese and Filipinos is intermediary. This pattern was observed when either daily or lifetime use of alcohol was compared and was fairly consistent

Table 6.–Percentage[a] of drinkers by race and sex, Hawaii, 1975-1980

Sex	Race Caucasian	 Native Hawaiian	 Japanese	 Filipino	 Chinese
Male	48.6	36.0	35.4	26.6	23.3
Female	30.0	13.3	6.1	3.9	6.8

[a] Age adjusted by the direct method to the World Standard Population (Waterhouse et al. [1976]).

Table 7.—Percent[a] distribution of drinkers by level of ethanol intake, sex, and race, Hawaii, 1975-1980

Sex	Ethanol intake (grams/day)	Race				
		Caucasian	Native Hawaiian	Japanese	Filipino	Chinese
Male	0.1-6.4	13.7	10.1	16.7	18.3	24.4
	6.5-29.5	50.6	48.0	56.9	53.8	60.2
	29.6-44.3	14.9	11.5	11.6	10.8	7.0
	44.4+	20.8	30.4	14.7	17.2	8.4
	Total	100.0	100.0	99.9	100.1	100.0
Female	0.1-6.4	29.6	23.1	40.1	38.4	46.0
	6.5-29.5	52.0	55.8	51.1	51.7	51.2
	29.6-44.3	10.5	8.3	5.4	5.4	0
	44.4+	7.9	12.8	3.4	4.5	2.8
	Total	100.0	100.0	100.0	100.0	100.0

[a] Age adjusted by the direct method to the World Standard Population (Waterhouse et al. [1976]).

Table 8.—Mean beer consumption (cans per week) among Native Hawaiians by degree of ethnic purity, Hawaii, 1975-1980

Sex	Age	100 percent Hawaiian	75 percent Hawaiian	50 percent Caucasian	50 percent Chinese
Male	18-29	9.4	5.9	8.4	7.8
	30-39	8.3	8.0	5.2	5.4
	40-49	4.6	7.9	8.1	8.8
	50-59	8.8	9.7	10.6	6.8
	60-69	6.9	6.5	6.4	–
	70+	9.0	1.6	–	–
	Age-adjusted				
	All	7.8	7.1	7.1	6.2
	≥45	7.7	7.0	7.8	6.3
Female	18-29	.9	.6	.8	1.7
	30-39	1.1	1.2	1.3	3.0
	40-49	2.1	1.3	1.2	1.4
	50-59	1.9	2.2	1.4	2.1
	60-69	1.4	.9	.4	0
	70+	.3	–	.3	–
	Age-adjusted				
	All	1.4	1.3	1.0	1.7
	≥45	1.5	1.9	.8	.9
N		(675)	(769)	(639)	(308)

– = mean based on fewer than 20 individuals.

Table 9.—Mean ethanol intake(grams per day) among Native Hawaiians by sex, age, and degree of ethnic purity, Hawaii, 1975-1980

Sex	Age	100 percent Hawaiian	75 percent Hawaiian	50 percent Caucasian	50 percent Chinese
Male	18-29	21.7	11.3	16.7	15.1
	30-39	16.0	16.8	9.5	11.8
	40-49	9.9	16.2	16.8	18.9
	50-59	16.8	19.8	22.6	15.2
	60-69	12.9	12.6	16.7	–
	70+	24.3	11.5	–	–
	Age-adjusted				
	All	16.3	14.9	14.9	13.1
	≥45	16.3	15.5	17.9	13.0
Female	18-29	1.7	2.0	2.5	3.1
	30-39	2.0	2.3	3.4	6.6
	40-49	4.3	2.9	4.4	4.1
	50-59	4.7	5.7	3.9	3.9
	60-69	2.7	2.2	3.6	2.1
	70+	1.0	–	2.4	–
	Age-adjusted				
	All	2.9	3.1	3.4	3.9
	≥45	3.3	4.4	3.8	2.4
N		(675)	(769)	(639)	(308)

– = mean based on fewer than 20 individuals.

Table 10.—Percent[a] distribution of Native Hawaiians by level of ethanol intake, sex, and degree of ethnic purity, Hawaii, 1975-1980

Sex	Ethanol intake (grams/day)	100 percent Hawaiian	75 percent Hawaiian	50 percent Caucasian	50 percent Chinese
Male	Abstainer	67.4	63.9	64.3	65.6
	0.1-6.4	3.9	2.3	2.1	2.5
	6.5-29.5	13.6	18.4	16.0	11.1
	29.6-44.3	3.2	3.5	4.7	6.3
	44.4+	11.9	11.8	12.9	14.4
	Total	100.0	99.9	100.0	99.9
Female	Abstainer	89.8	86.2	83.9	87.2
	0.1-6.4	2.0	3.5	2.7	3.4
	6.5-29.5	5.9	7.1	9.5	4.6
	29.6-44.3	.2	1.0	2.1	1.3
	44.4+	2.1	2.1	1.7	3.5
	Total	100.0	99.9	99.9	100.0

[a] Age adjusted by the direct method to the World Standard Population (Waterhouse et al. [1976]).

Figure 1. Percent distribution of beer drinkers by number of days per week they drink, by sex, race, and age: Hawaii, 1975-1980

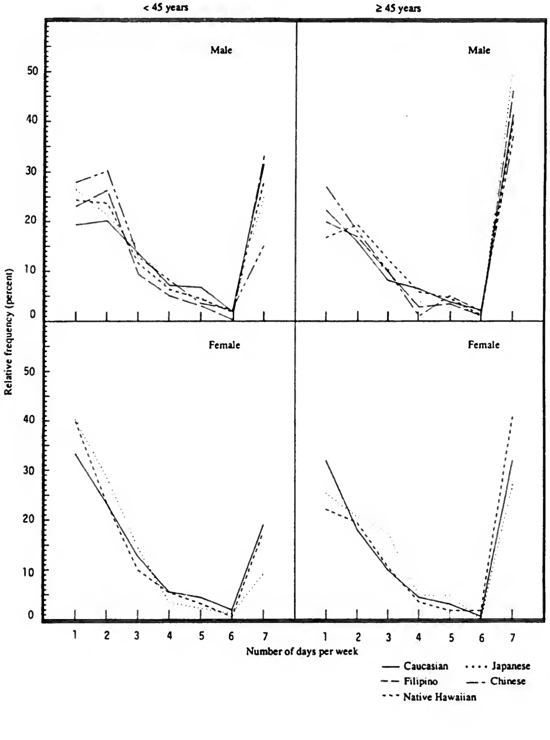


Figure 2. Percent distribution of wine drinkers by number of days per week they drink wine, by sex, race, and age: Hawaii, 1975-1980

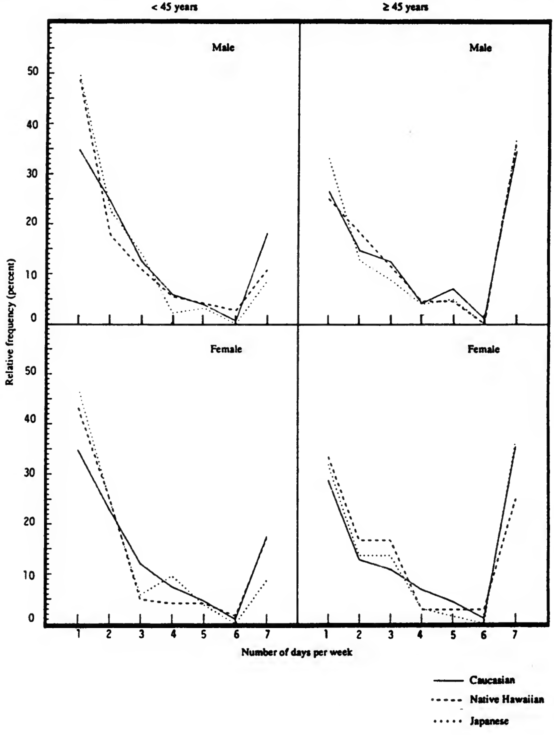


Figure 3. Percent distribution of hard liquor drinkers by number of days per week they drink hard liquor, by sex, race, and age: Hawaii, 1975-1980

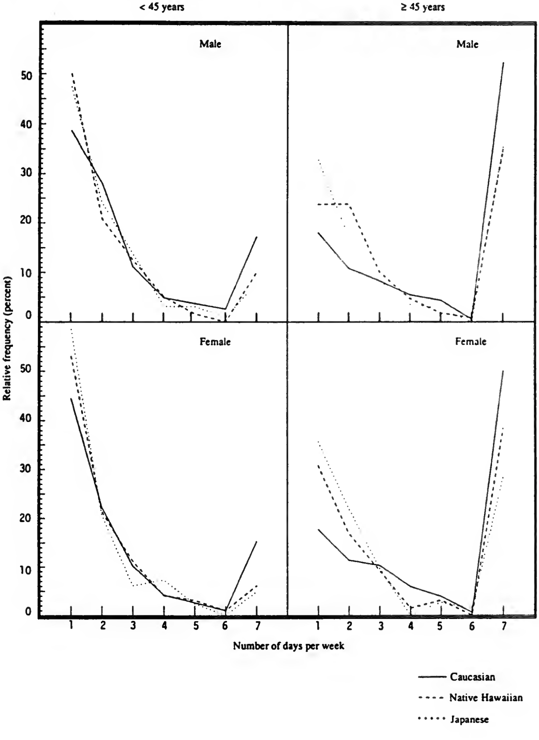


Table 11.–Mean age at which subjects started to drink alcoholic beverages by sex, race, and age, Hawaii, 1975-1980

		Race				
Sex	Age at interview	Caucasian	Native Hawaiian	Japanese	Filipino	Chinese
Male	18-29	17.7	17.5	18.8	18.1	19.0
	30-39	19.3	18.8	20.7	20.1	23.0
	40-49	20.2	20.7	22.1	21.7	22.2
	50-59	21.7	21.2	24.5	22.8	25.4
	60-69	24.0	21.7	26.6	25.6	28.6
	70+	27.3	27.4	30.2	30.7	24.1
	Age-adjusted	20.3	20.0	22.1	21.4	22.7
Female	18-29	18.9	18.5	19.3	18.7	20.3
	30-39	20.8	20.9	22.8	23.7	22.4
	40-49	23.2	24.3	27.7	24.9	27.1
	50-59	26.2	26.8	34.4	36.7	29.2
	60-69	27.8	23.5	37.9	39.2	35.7
	70+	31.1	28.2	38.2	32.0	37.7
	Age-adjusted	22.4	22.4	26.5	25.7	25.7

Table 12.–Mean age at which Native Hawaiians started to drink alcoholic beverages by sex and age, Hawaii, 1975-1980

Sex	Age at interview	100 percent Hawaiian	75 percent Hawaiian	50 percent Caucasian	50 percent Chinese
Male	18-29	16.7	17.6	17.6	18.9
	30-39	20.0	17.2	17.7	22.2
	40-49	20.9	19.6	19.9	20.2
	50-59	18.2	20.6	19.2	18.5
	60-69	21.1	18.3	23.6	28.7
	70+	–	–	–	–
	Age-adjusted	19.1	18.8	19.8	21.0
Female	18-29	17.4	18.6	19.0	18.0
	30-39	18.5	19.1	21.6	20.0
	40-49	21.9	25.8	25.5	18.7
	50-59	22.7	30.0	25.0	26.0
	60-69	–	–	25.8	–
	70+	–	–	–	–
	Age-adjusted	20.3	23.4	22.4	21.2

– = mean based on fewer than five subjects.

Figure 4. Correlation between age-adjusted incidence rates ofesophageal cancer and age-adjusted mean alcohol consumption for 10 ethnic\sex subgroups in Hawaii

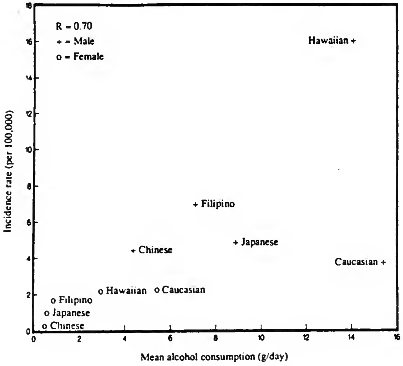
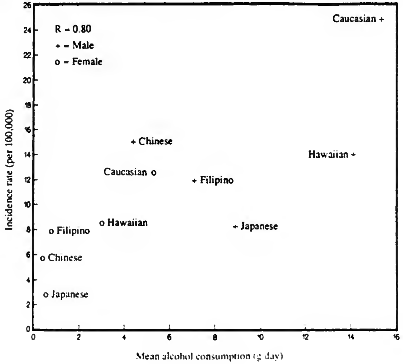


Figure 5. Correlation between age-adjusted incidence rates of oral and pharyngeal cancers and age-adjusted mean alcohol consumption for 10 ethnic\sex subgroups in Hawaii



among sexes and age groups. The prevalence rate of alcohol use was not greater among Native Hawaiian males than among Japanese males; however, in both sexes, Native Hawaiians who drank were likely to consume a greater quantity of alcohol than drinkers from other races. Weekly drinking patterns were very similar among races and therefore did not suggest that binge or regular drinking occur to different degrees among the races studied.

The validity of self-reported alcohol consumption data is difficult to assess (Midanik 1982). Most researchers, however, believe that the apparent underreporting in such data occurs mainly among subjects who drink heavily (Cahalan 1981). Since abusers represent a small proportion of the population, the effect of this reporting bias on the results of general population surveys is likely to be small (Williams et al. 1985). Furthermore, there is no indication that underreporting in Hawaii occurs more often for some races than for others. Comparison of the present survey data with those obtained in other population-based surveys suggests that Caucasians consume comparable amounts or possibly less alcohol in Hawaii than elsewhere in the United States (Jones et al. 1982; Fisher and Gordon 1985; Malin et al. 1982). Similarly, other studies have shown markedly lower alcohol consumption among Orientals compared with Caucasians (Klatsky et al. 1977).

Although total ethanol consumption is similar among Caucasians and Native Hawaiians, these two groups differ in their drinking preferences. Caucasians drink more wine and spirits, whereas Hawaiians (especially males) drink more beer. Since among males the incidence rate of esophageal cancer is much higher in Native Hawaiians than in Caucasians, this pattern could suggest a specific role for beer drinking in the etiology of this form of cancer. Indeed, using a subset of these data, Hinds et al. (1980) showed a significant correlation between beer consumption and the incidence of esophageal cancer among the 10 major ethnic-sex subgroups in Hawaii. This association agrees with the results of Mettlin et al. (1980), who reported a stronger association of esophageal cancer risk with beer consumption than with wine or liquor consumption. However, it contradicts the results of most other studies that showed either a stronger association for hard liquor (Pottern et al. 1981; Wynder and Bross 1961) or an association with total alcohol consumption without specificity for any type of alcoholic beverage (Breslow and Enstrom 1974; Williams and Horm 1977). Since beer is the alcoholic beverage most frequently consumed by the five groups studied in Hawaii, it is the major contributor to total alcohol intake. Therefore, it is impossible with this type of aggregate data to clearly differentiate an effect of beer from an effect of ethanol in general. This cohort of approximately 50,000 persons is presently being followed for cancer occurrence, and this issue will be studied more efficiently by comparing the drinking patterns of individuals who develop esophageal cancer with those of the subjects who do not.

The present data have revealed that, in Hawaii, alcohol consumption patterns explain the ethnic variation in incidence for cancer of the mouth and pharynx better than they do for cancer of the esophagus. This discrepancy results primarily from the relatively low risk of esophageal cancer experienced by Caucasian males and, to a lesser degree, by Caucasian females and is not readily explained by differences in other known or suspected risk factors for esophageal cancer, such as smoking (which was highly correlated with alcohol consumption in these data) and consumption of fruits and vegetables.

In many other areas of the world where esophageal cancer incidence is high, alcohol consumption cannot explain the pattern of occurrence. A number of studies have indicated that such populations at high risk have specific dietary inadequacies. Low intakes of riboflavin and vitamin A have been reported among high-risk groups in Puerto Rico (Martinez 1969); riboflavin, vitamin C, and vitamin A deficiencies have been described in high-risk populations of northern Iran (Cook-Mozaffari et al. 1979); and studies in China have implicated low intakes of trace elements (zinc and molybdenum), fruits and vegetables, animal products, riboflavin, and calcium, as well as high intakes of nitrosamines present in pickled vegetables and in moldy foods (Yang 1980). In the United States, Ziegler et al. (1981) reported that smoking and alcohol consumption do not explain entirely the high incidence of esophageal cancer observed among blacks in Washington, D.C. They implicated poor nutrition as an independent predictor of risk but were unable to identify specific nutrient deficiencies.

These observations suggest that the ethnic differences in esophageal cancer risk observed in Hawaii may be due partly to selective nutritional factors. Native Hawaiians and Orientals, who consume more pickled vegetables and dried and salted fish than Caucasians do (Kolonel 1980), are probably exposed to a greater amount of nitrosamines in their diet. This exposure is also thought to contribute to their increased risk for stomach cancer. However, not much is known at present about the consumption of vitamins, such as riboflavin and thiamin, and of minerals, such as zinc and molybdenum, among Hawaii's population.

In conclusion, this study has shown that there are substantial ethnic differences in alcohol consumption in Hawaii. Alcohol consumption and smoking patterns explain well the ethnic variation in oropharyngeal cancer incidence, but they do not adequately explain the variation in esophageal cancer incidence. Studies are needed to investigate additional risk factors for esophageal cancer in Hawaii, such as possible moderate vitamin and mineral deficiencies in relation to smoking and the consumption of alcohol, pickled vegetables, or dried/salted fish.

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Asian Americans and Alcohol: The Chinese, Japanese, Koreans, and Filipinos in Los Angeles

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ABSTRACT

This paper challenges the commonly held beliefs that Asian Americans are categorical abstainers and experience relatively few alcohol-related problems. Such thinking implies that different groups of Asians exhibit similar patterns of abstention and drinking. To explore these generalizations, alcohol consumption patterns are compared in a survey of 298 Chinese, 295 Japanese, 280 Koreans, and 230 Filipinos in Los Angeles. Chinese, Japanese, and Korean samples were randomly drawn from local telephone directories based on listed surnames; the Filipino sample was selected from among persons affiliated with several ethnic organizations, using a snowball sampling technique. Respondents were interviewed by individuals of similar ethnicity using interview schedules that included measures of drinking quantity, frequency, and variability (QFV). Data were collected on demographic characteristics; participation in leisure-time activities; socialization and friendship patterns; religiosity; family background; drinking attitudes, effects, and reasons for not drinking; alienation; and the Asian flushing reflex.

The basic hypothesis tested in this study is that patterns of abstention and alcohol consumption differ for the four Asian groups. In support of this contention, statistically significant differences were found between the groups on alcohol QFV measures by sex, age, place of birth, and personal drinking attitudes. The Japanese and Chinese had a higher proportion of drinkers than abstainers, whereas the reverse held true for the Koreans and Filipinos. Except for the Japanese, the abstainers were overwhelmingly female. Heavy drinking was found in each of the Asian groups and was primarily a male activity. The heaviest drinking was found among the Japanese and the lowest among the Chinese. By using multiple regression, five independent variables (i.e., sex, age, motives for drinking, drinking consequences, and drinking attitudes) were found to account for 43 percent of the dependent QFV measure of alcohol consumption, thereby providing a model with relatively high power in predicting drinking patterns. The findings in this study appear to refute the idea of a uniform pattern of drinking and abstinence among Asian Americans. Like other U.S. minority populations, there is cultural diversity within the Asian group–including different philosophies about the role of alcohol–which is viewed as having a definite effect on drinking styles.

Introduction

There are several common beliefs concerning Asian Americans and alcohol. One assumption is that Asians experience few problems associated with alcohol. Another is that alcohol research findings on Asians are generalizable across the various Asian subgroups. For example, if the Chinese are believed to be a low-drinking group, the assumption is made that the same is true for other Asian groups such as the Japanese, Koreans, and Filipinos. These perceptions are reflected in programs, research, and policy, which frequently lump Asian Americans together into one undifferentiated unit.

The purpose of this paper is to compare the alcohol consumption patterns of the Chinese, Japanese, Koreans, and Filipinos in Los Angeles based on data collected in 1981 and 1982. The Chinese, Japanese, and Korean samples were drawn from Los Angeles telephone directories by using a purposive random sampling technique. Potential respondents were selected on the basis of their surnames, which were readily identifiable for the three groups. Since most heads of households in the Asian community were presumed to be male, a proportion of the interviews were reserved for females.

Filipinos were more difficult to identify because a large number of their surnames are Hispanic. Consequently, a snowball sampling technique was devised wherein different Filipino organizations were identified, and individuals from these organizations were selected for the interviews. Although a randomization procedure based on census tracts and blocks would have been preferable in selecting the study sample, the total number of Asians in any area was too small and scattered to employ this technique.

Respondents were interviewed in their homes by interviewers of Asian ancestry. Completed interviews were obtained from 298 Chinese, 295 Japanese, 280 Koreans, and 230 Filipinos for a total of 1,103 interviews. Interview questions were based on a study by Cahalan et al. (1969), and drinking patterns were measured by Cahalan's quantity, frequency, and variability scale (QFV). Telephone contacts were made prior to the interview--a procedure that proved successful in keeping the number of "no shows" to less than 5 percent. Respondents were given token gifts for their participation.

This paper concentrates on overall comparisons between the Chinese, Japanese, Koreans, and Filipinos and their alcohol consumption patterns based on the survey data. The basic hypothesis tested in this study was that patterns of alcohol consumption would be different for each of the groups. As part of the study, a model was developed for predicting alcohol consumption patterns for the total sample. Two other papers focusing on alcohol use among the Chinese (Sue et al. 1985) and the Japanese (Kitano et al. 1985), based on clinical and case study data, have already been published.

Results

Demographic Data

Table 1 presents data on gender, age, marital status, place of birth, language use, income, education, and occupation for the Chinese, Japanese, Korean, and Filipino samples. The respondents were primarily married males, with an age spread from under 30 to over 61 years. The majority were foreign born (with the exception of the Japanese), which reflects the pattern of recent heavy immigration from China, Korea, and the Philippines.

Income figures were based on total household income and show modal rates in the $20,000 to $30,000 range. The modal rate of education was at the college level, and the mode for occupation was at the professional level, with the exception of the Koreans, where the clerical category was the mode.

The Chinese sample consisted primarily of males aged 31 to 45 who were married, foreign born, and non-English speaking, with a median income of $19,000. Most were college educated, and their occupations were nearly evenly divided between the professional and clerical categories.

The Japanese sample consisted predominantly of males aged 46 to 60 who were married, born in the United States, and English speaking. Their median income was $25,000, and the majority were college graduates in professional occupations.

The Korean sample was more evenly divided between males and females aged 31 to 45 who were married, were born in Korea, and spoke Korean as their main language. Median family income was $37,000, and most were college graduates from Korean universities. The most common occupational category was clerical.

The Filipinos were primarily males aged 31 to 45 who were married, born in the Philippines, and more

Table 1.–Demographic data on the sampled Chinese, Japanese, Koreans, and Filipinos in Los Angeles

	Chinese		Japanese		Korean		Filipino	
Item	N	Percent	N	Percent	N	Percent	N	Percent
Gender								
Male	218	73.2	235	79.7	155	55.4	145	63.0
Female	80	26.8	60	20.3	125	44.6	85	37.0
Age								
Under 30	86	29.7	48	16.3	42	15.0	47	22.8
31-45	123	26.2	72	24.4	136	48.6	86	41.8
46-60	53	18.2	119	40.3	67	23.9	50	24.2
61+	28	15.9	56	19.0	35	12.5	23	11.2
Marital status								
Married	186	62.4	196	66.4	251	89.4	157	68.9
Single	100	33.6	64	21.7	18	6.4	44	19.3
Separated, widowed, divorced	12	4.0	35	11.8	11	4.0	27	11.9
Place of birth								
Foreign born	263	88.3	76	25.8	279	99.6	224	97.4
U.S. born	35	11.7	219	74.2	1	.4	6	2.6
Language use								
Primarily English	48	16.2	241	82.0	5	1.9	18	8.7
Non-English	250	83.8	54	18.0	275	98.1	212	91.3
Income (family)								
<6,000	28	12.2	13	4.6	6	2.4	5	2.8
6,000-10,000	21	9.1	12	4.3	18	7.1	9	5.0
10,001-20,000	56	24.3	60	21.4	33	13.0	39	21.6
20,001-30,000	60	26.1	64	22.9	58	22.7	49	27.2
30,001-40,000	23	10.0	65	23.3	39	15.3	36	18.0
>40,000	36	15.7	50	17.9	36	14.1	33	18.3
Education								
High school graduate	104	36.5	81	28.5	59	21.3	17	8.3
College	106	37.2	143	50.3	130	47.0	134	65.0
Graduate school	74	26.0	58	20.4	80	28.9	55	26.7
Occupation								
Professional	89	38.8	139	56.7	44	22.6	89	38.9
Clerical	74	32.3	63	25.7	104	53.3	74	32.3
Skilled labor	26	11.4	27	11.0	36	18.5	26	11.4
Semiskilled labor	22	9.6	11	4.5	7	3.6	22	9.6
Unskilled labor	18	7.8	5	2.0	4	2.0	18	7.8
N	298		295		280		230	

familiar with various Philippine dialects than with English. The median family income was $31,000, and most respondents had a college education. Occupations were evenly divided between the professional and clerical categories.

Alcohol Consumption by Ethnic Group

Table 2 displays the total alcohol drinking patterns of the Chinese, Japanese, Koreans, and Filipinos. In terms of the total sample, the Japanese had the highest percentage of heavy drinkers (25.4 percent), followed by the Filipinos (19.6 percent), the Koreans (14.6 percent), and the Chinese (10.4 percent). The highest percentage of moderate drinkers were Chinese (48.3 percent), followed by Japanese (41.7 percent), Filipinos (29.2 percent), and Koreans (23.6 percent). The Koreans had the highest percentage of abstainers (61.8 percent), followed by the Filipinos (51.3 percent), the Chinese (41.3 percent), and the Japanese (32.9 percent). The differences between the groups were statistically significant.

Male consumption of alcohol is also shown in table 2. Filipino males had the highest percentage of heavy drinkers (29.0 percent), followed by the Japanese (28.9 percent), the Koreans (25.8 percent), and the Chinese (14.2 percent). The Chinese had the highest percentage of moderate drinkers (54.6 percent), followed by the Japanese (38.3 percent), the Filipinos (36.6 percent), and the Koreans (28.4 percent). The Koreans had the highest percentage of abstainers (45.8 percent), followed by the Filipinos (34.5 percent), the Japanese (32.8 percent), and the Chinese (31.2 percent). The differences were statistically significant.

Finally, the data for the females are shown in table 2. The Japanese had the highest percentage of heavy drinkers (11.7 percent), followed by the Filipinos (3.5 percent), the Koreans (0.8 percent), and the Chinese (0.0 percent). The Japanese also had the highest percentage of moderate drinkers (55.0 percent), followed by the Chinese (31.3 percent), the Koreans (17.6 percent), and the Filipinos (16.5 percent). The Koreans had the highest percentage of abstainers (81.6 percent), followed by the Filipinos (80.0 percent), the Chinese (68.8 percent), and the Japanese (33.3 percent). The female drinking patterns show striking differences, especially for the Japanese, but statistical significance is not presented because of the small numbers in several of the cells.

Table 2.–Alcohol consumption patterns by sex of Chinese, Japanese, Koreans, and Filipinos in Los Angeles, in percent

QFV	Chinese	Japanese	Korean	Filipino
Male[a]				
Abstainer	31.2	32.8	45.8	34.5
Moderate	54.6	38.3	28.3	36.6
Heavy	14.2	28.9	25.8	29.0
N	(218)	(235)	(155)	(145)
Female				
Abstainer	68.8	33.3	81.6	80.0
Moderate	31.3	55.0	17.6	16.5
Heavy	0	11.7	.8	3.5
N	(80)	(60)	(125)	(85)
Total[b]				
Abstainer	41.3	32.9	61.8	51.3
Moderate	48.3	41.7	23.6	29.1
Heavy	10.4	25.4	14.6	19.6
N	(298)	(295)	(280)	(230)

[a] $\chi^2 = 36.17; p < 0.0000$.

[b] $\chi^2 = 79.97; p < 0.0000$.

Two general observations can be made concerning the four different ethnic groups on the basis of these data. First, the groups show significant differences in their alcohol drinking patterns. Second, heavy drinking is primarily a male activity, while abstainers are primarily female.

Alcohol Consumption by Age and Sex

Table 3 shows the alcohol consumption patterns of the four groups by sex. Male drinking patterns varied by age and ethnic group. For example, the bulk of heavy Chinese drinkers were in the 26- to 35-year-old category (44.8 percent). Japanese heavy drinkers were rather evenly distributed among most of the age categories. The Korean heavy drinkers were predominantly between 36 and 45 years old (40.0 percent). The Filipino heavy drinking pattern was evenly distributed by age, except among the oldest age group. The numbers in several of these cells were so small that statistically significant comparisons are not presented.

Moderate male drinkers also showed dissimilar patterns of alcohol consumption. The bulk of Chinese moderate drinkers were aged 26 to 35 (43.5 percent). Japanese moderate drinkers were primarily aged 46 to 55 (23.3 percent) and 56 and older (34.4 percent). The Korean pattern was distributed among all of the age categories. Among Filipinos, the heaviest concentration of moderate drinkers was in the age range of 36 to 45 (43.2 percent).

Chinese and Korean abstainers were relatively spread out among all of the age groups. For the Japanese, the abstainers were most prominent among those 46 and over. The Filipino abstainers were concentrated between the ages of 36 and 55.

Table 3 also displays alcohol consumption patterns for females by ethnic group and age. Female numbers, especially in the heavy drinking category, are small, so the percentage figures should be interpreted with caution. Among heavy drinkers, the largest proportions of both Japanese (42.9 percent) and Filipinos (66.7 percent) were 26 to 35 years old. There were virtually no heavy drinkers among the Chinese and the Koreans.

In the moderate category, most of the Chinese and Koreans were in the under 25 age group (30.4 percent and 27.3 percent, respectively) and the 26 to 35 age group (39.1 percent and 36.4 percent, respectively). Japanese moderate drinkers were in the 26 to 35 age group (27.3 percent) and the 56 and older (21.2 percent) age group; Filipinos were in the 26 to 35 (33.3 percent) and 36 to 45 (33.3 percent) age groups.

Most Chinese female abstainers were evenly distributed in the under 25 (23.6 percent), 26 to 35 (32.7 percent), and 36 to 45 (23.6 percent) age groups. The bulk of Japanese and Filipino abstainers were in the 56 and older age groups (70.0 percent and 34.3 percent, respectively).

Analysis by Age and Drinking Patterns

One-way analysis of variance was used to test for significant differences by age and alcohol consumption for the four groups. It was hypothesized that the four ethnic groups would differ by age and QFV. This hypothesis was confirmed with the exception of the similarity between Chinese and Korean females, of whom there are few or no heavy drinkers no matter what the age.

Drinking Consequences

Table 5 shows drinking consequences and QFV by ethnic group. There was a similar pattern for all groups on items 1 (feel happy), 4 (pass out), 5 (have hangover), 6 (get loud and noisy), 8 (get into argument), 9 (get rid of hangover), 10 (stay away from work), 11 (told to cut down on drinking), 15 (difficult to stop before getting drunk), and 16 (upon awakening, can't remember). The overall results indicate that among Asians there are significant differences on those items related to perceived personal attitudes about the effects of alcohol and alcohol consumption patterns (QFV).

Perceived Social Attitudes

The relationship between social attitudes toward alcohol and drinking patterns by ethnic group is shown in table 6. There were eight items in this category, and more permissive attitudes were related to heavier alcohol consumption.

Motives for Drinking

The relationship between motives for drinking, QFV, and ethnic group is shown in table 7. Heavy drinkers were most likely to report "positive" motives for drinking.

Model for Predicting Alcohol Consumption

On the basis of our results, we developed a model to predict the alcohol consumption patterns of the total

Table 3.—Alcohol consumption patterns by sex and age of Chinese, Japanese, Koreans, and Filipinos in Los Angeles

Consumption pattern	Age group											
	Under 25		26-35		36-45		46-55		56 or over		Total	
	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent	N	Percent
MALE												
Abstainer												
Chinese	6	8.8	18	26.5	12	17.6	17	25.0	15	22.1	68	32.1
Japanese	5	6.5	4	5.2	7	9.1	29	37.7	32	41.6	77	32.8
Korean	2	2.8	13	18.3	21	29.6	18	25.4	17	23.9	71	45.8
Filipino	4	8.9	7	15.6	16	35.6	14	31.1	4	8.9	45	36.3
Moderate												
Chinese	10	8.7	50	43.5	25	21.7	10	8.7	20	17.4	115	54.2
Japanese	6	6.7	19	21.1	13	14.4	21	23.3	31	34.4	90	38.3
Korean	3	6.8	11	25.0	13	29.5	10	22.7	7	15.9	44	28.4
Filipino	6	13.6	12	27.3	19	43.2	5	11.4	2	4.5	44	35.5
Heavy												
Chinese	5	17.2	13	44.8	5	17.2	2	6.9	4	13.8	29	13.7
Japanese	6	8.8	17	25.0	19	27.9	12	17.6	14	20.6	68	28.9
Korean	1	2.5	12	30.0	16	40.0	9	22.5	2	5.0	40	25.8
Filipino	9	25.7	9	25.7	5	14.3	9	25.7	3	8.6	35	28.2
FEMALE												
Abstainer												
Chinese	13	23.6	18	32.7	13	23.6	6	10.9	5	9.1	55	70.5
Japanese	0	0	1	5.0	1	5.0	4	20.0	14	70.0	20	33.3
Korean	5	4.9	30	29.4	34	33.3	16	15.7	17	16.7	102	81.6
Filipino	4	6.0	11	16.4	18	26.9	11	16.4	23	34.3	67	81.7
Moderate												
Chinese	7	30.4	9	39.1	5	21.7	1	4.3	1	4.3	123	29.5
Japanese	5	15.2	9	27.3	3	9.1	9	27.3	7	21.2	33	55.0
Korean	6	27.3	8	36.4	2	9.1	3	13.6	3	13.6	22	17.6
Filipino	2	16.7	4	33.3	4	33.3	2	16.7	0	0	12	14.6
Heavy												
Chinese	0	0	0	0	0	0	0	0	0	0	0	0
Japanese	1	14.3	3	42.9	1	14.3	2	28.6	0	0	7	11.7
Korean	0	0	1	100.0	0	0	0	0	0	0	1	.8
Filipino	0	0	2	66.7	1	33.3	0	0	0	0	3	3.7

Table 4.—Summary of one-way ANOVA for age and QFV by sex and ethnic group

Sex/ethnic group	F ratio	Significance
Male		
Chinese	3.48	<.05
Japanese	6.03	<.005
Korean	3.14	<.05
Filipino	3.49	<.05
Female		
Chinese	.916	n.s.
Japanese	10.03	<.001
Korean	2.48	n.s.
Filipino	5.26	<.01

n.s. = not significant.

sample. The five independent variables in the model were age, sex, consequences, social atititudes toward drinking, and motives for drinking.

Before utilizing multiple regression techniques, the bivariate relations among the variables were tested. The initial step was to determine the relationship between the five independent variables and alcohol consumption as measured by QVF. A t-test was performed on the sex variable, and Pearson R correlations were performed on the four remaining variables (i.e., age, motives, consequences, and atittudes). Comparison of men and women revealed significant differences regarding QFV ($t = 14.51$, $df = 1{,}000$, $p < .0001$), with men reporting higher QFV $\overline{X} = 4.15$) than women ($\overline{X} = 2.98$). The Pearson R correlations are

Table 5.—Summary of one-way ANOVA for drinking consequences and QFV by ethnic group

Consequences	Significance			
	Chinese	Japanese	Korean	Filipino
1. Feel happy	.01	.01	.01	.01
2. Difficulty walking	.05	.01	n.s.	.01
3. Feel sleepy	n.s.	n.s.	n.s.	.01
4. Pass out	.01	.01	.05	.01
5. Have hangover	.01	.01	.01	.01
6. Get loud and noisy	.01	.01	.01	.01
7. Get into fight	n.s.	n.s.	n.s.	.01
8. Get into argument	.01	.01	.01	.01
9. Get rid of hangover	n.s.	.01	.01	.05
10. Stay away from work	.01	.01	.01	.01
11. Told to cut down on drinking	.01	.01	.01	.01
12. Get high on job	n.s.	.01	.01	n.s.
13. Lose or nearly lose job	n.s.	n.s.	n.s.	n.s.
14. Spend too much money	n.s.	.01	.01	.01
15. Difficult to stop before getting drunk	.01	.01	.01	.01
16. Upon awakening, can't remember	.01	.01	.05	.01
17. Skip meals	n.s.	.01	.01	.01
18. Take a quick drink	n.s.	.01	n.s.	.01
19. Worry not able to get a drink	n.s.	n.s.	.01	.01

n.s. = not significant.

Table 6.—Summary of one-way ANOVA for perceived social attitudes toward alcohol and QFV by ethnic group

	Significance			
Attitude items	Chinese	Japanese	Korean	Filipino
1. Ashamed to tell about alcohol problems	n.s.	n.s.	.01	n.s.
2. Leaders don't solve alcohol problems	.05	n.s.	n.s.	.01
3. Drunks should be punished	n.s.	n.s.	.01	n.s.
4. Drinking is one's own business	.05	.01	n.s.	.05
5. Community should help family	n.s.	n.s.	n.s.	n.s.
6. Would not know where to turn	n.s.	n.s.	n.s.	.01
7. Lower opinion of alcoholic	n.s.	.05	.01	n.s.
8. Do things they should not	.05	.05	.01	n.s.

n.s. = not significant.

Table 7.—Summary of one-way ANOVA for motives for drinking and QFV by ethnic group

	Significance			
Motives	Chinese	Japanese	Korean	Filipino
1. Feel good	.05	.01	.01	.01
2. To be sociable	n.s.	.01	.01	.01
3. Cheer me up	.01	.01	.01	.01
4. Fight tension, nervousness	.01	.01	.01	.01
5. Help self-confidence	.05	.05	.01	.01
6. Nothing else to do	n.s.	n.s.	.01	.01
7. Less shy with opposite sex	.01	.01	n.s.	.01
8. Drink to get drunk	.01	.01	n.s.	n.s.
9. Say and do things out of norms	.01	n.s.	n.s.	.01

n.s. = not significant.

Table 8.—Pearson correlation coefficients: QFV, age, motives, consequences, and attitudes

Variable	QFV	Age	Motives	Consequences	Attitudes
QFV	1.00	-.18	.38	.57	.24
Age		1.00	-.12	-.16	-.06
Motives			1.00	.35	.18
Consequences				1.00	.22
Attitudes					1.00

Note: The *p*-values are significant at the .0001 level except for two pairs: Age and motives; age and attitudes.

shown in table 8. Alcohol consumption was significantly related to all four of the independent variables.

Multiple regression was used to examine the role of sex, age, consequences, attitudes, motives, and QFV. The ranked standardized regression coefficients, indicating the relative influence of the five independent variables in our model of alcohol consumption, are as follows: consequences (0.41), followed by sex (0.23), motives for drinking (0.18), drinking attitudes (0.10), and age (0.10). All of the variables are significant at the $p < .0001$ level. The total amount of variance (R-square) that can be explained through the five independent variables is 43 percent, indicating a relatively high predictive power.

Discussion

The study contributes to our knowledge of immigrants and ethnocultural styles of drinking. It follows the tradition of Cahalan and Cisin (1976), whose surveys demonstrated the various drinking styles of different ethnic groups. Therefore, it is not too surprising that the four ethnic groups showed different patterns of alcohol consumption, even though they migrated from the same part of the world and are often perceived as looking alike.

In our review of research on Asian alcohol drinking patterns (Kitano 1982), we mentioned the different philosophies that have influenced their drinking styles. For example, Confucian and Taoist philosophies in China emphasized the need for moderation and took the position that while drinking could be pleasurable, one should not act like a fool (Singer 1974). In Japan, there was the influence of Chinese philosophy and Buddhism, as well as a contemporary, urban, business-oriented, industrial society that holds a permissive view towards alcohol. Filipino native consumption patterns have been influenced by waves of colonial powers, including Spain, the United States, and Japan. The Korean attitude toward alcohol apparently is a permissive one, especially with regard to male drinking (which holds true for most Asian groups). Alcohol is valued in the Korean culture, but members are admonished never to drink to the point of acting stupidly.

It should be noted that with the exception of the Japanese, the largest number of our respondents were foreign born, so their drinking styles largely have been brought over from their country of origin. For example, even though the most popular drinks were beer and hard liquor, Filipino respondents mentioned "tuba," which is derived from the coconut tree, as a popular alcoholic drink. Other Asians mentioned drinking sake and brands of beer and liquor that were a part of the culture of the home country. However, it should also be emphasized that the actual consumption of alcohol is taking place in Los Angeles so that variables are as important as historical philosophies. In spite of the cultural differences, there were similarities in terms of those who were most likely to drink.

The study findings support Cahalan and Cisin's (1976) generalization that those most likely to drink are men under the age of 45 who have higher social status and who are college graduates in professional or white-collar occupations and live in large cities. Among this group, personal attitudes toward alcohol are permissive, and friends are tolerant of drinking. Our sample of drinkers showed all of the mentioned characteristics.

Yet, in spite of the evidence of heavy drinking in our samples, very little "problem behavior" was reported. There were a few instances of being arrested for drinking; otherwise, there was little evidence of losing jobs, of personal impairment, or of drastic changes in life styles. Much of the drinking was done with friends and on special occasions (e.g., weddings and anniversaries), so there were social controls on drinking behavior.

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The Flushing Response and Alcohol Use

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ABSTRACT

A large proportion of persons of Mongoloid ancestry demonstrate a flushing response (i.e., a reddening or flushing of the skin after drinking alcohol). Persons of Mongoloid ancestry also generally use less alcohol than do persons of Caucasoid ancestry. It has been hypothesized that flushing is associated with other unpleasant symptoms and that, therefore, persons who flush are less likely to use alcohol. This paper reports the results of a series of pedigree studies on alcohol use, flushing, and symptoms associated with flushing. Data were obtained on families from a variety of ethnic groups in Hawaii as well as from families in Taiwan and Korea. There appear to be two varieties of flushing: fast flush (FF), which occurs after one drink or less, and slow flush (SF), which occurs after two or more drinks. There are very substantial racial/ethnic differences in the proportion of persons who flush, as well as in flushing type, with persons of Asian ancestry more frequently being fast flushers. Flushing appears to be largely genetically controlled. The data seem to suggest that flushing results from a single autosomal dominant gene, although this contention is not totally supported. Different patterns of family resemblance across fast-flushing and slow-flushing types suggest that the two forms of flushing are under different kinds of genetic control. Data from other laboratories indicate that different enzyme systems may trigger the two types of flushing, so that different genetic mechanisms might be expected.

Contrary to popular beliefs, flushing is only marginally related to reduced alcohol use. It has long been known that Native Americans show high rates of flushing, but still use considerable amounts of alcohol. Data presented here show only slight differences in alcohol use among nonflushers, slow flushers, and fast flushers in Hawaii and Taiwan. Homeland Koreans drink a great deal if they drink at all, and among Koreans (but not among those who are residents of Hawaii or of Taiwan), fast flushing is associated with a variety of other symptoms. Koreans who are fast flushers drink substantially less than nonflushing or slow-flushing Koreans. Flushing may have an "immunizing" effect only in intact cultures (unlike most Native American groups) with a high level of "normative" alcohol use.

Introduction

Ethnic group differences in alcohol use between Caucasians and Orientals have been reported frequently in the literature. Survey data obtained in Hawaii (Kolonel 1979; Wilson et al. 1978) and on the U.S. mainland (Klatsky et al. 1983) consistently indicate that there is substantially less alcohol consumption in the Japanese and Chinese populations than in the Caucasian population. Numerous reports (Ewing et al. 1979; Hanna 1978; Reed 1978; Zeiner et al. 1979) have sought to explain the Caucasian-Oriental difference in drinking behavior in terms of an elevated sensitivity to alcohol among Orientals. This difference is probably genetically based because Orientals experience more aversive physiological responses to alcohol use than do Caucasians. One of the more readily apparent physiological responses commonly seen in Orientals is the phenomenon of flushing.

The flushing response following the ingestion of alcohol is defined as vasodilation resulting in a reddening or flushing of the skin. It was well known in literature long before it became a matter of scientific interest. English squires, flushed with drink, are not at all uncommon in literature. Long John Silver and his piratical crew were described as being flushed with drink, and so were Mark Twain's pals in Nevada and California. Thus, flushing in response to alcohol is not solely an attribute of persons of Asian ancestry.

The first researcher to study flushing and to investigate racial and ethnic differences in flushing was Peter Wolff (1972), who, in alcohol challenge tests, assessed flushing through photometric measures of skin reflectance. Wolff found that, following administration of a relatively small amount of alcohol, adult persons of Mongoloid ancestry generally flushed, while persons of Caucasoid ancestry typically did not flush. In the same paper, he reported on a second study of Mongoloid and Caucasoid infants who were given small doses of alcohol. These infants, without previous exposure to alcohol, showed the same kind of difference between flushing across racial and ethnic groups as did the adult subjects. Thus, differences between groups did not appear to be the result of tolerance through habituation. It was concluded that flushing provides visible evidence of alcohol use, is itself unpleasant, and is often accompanied by other unpleasant symptoms. Persons of mixed Asian-European ancestry were found to be similar to persons of Asian ancestry in their flushing response (Wolff 1973).

These data suggested that flushing is probably inherited as an autosomal dominant gene. Furthermore, Wolff took note of the fact that other groups of Mongoloid ancestry (i.e., Native Americans, Indians, Aleuts, and Eskimos) also flush with considerable frequency, but often are not abstemious. He suggested that flushing might lead to a reduction in alcohol use only in relatively intact cultures. Hence, there is an absence of any "immunizing" effect among Native Americans, despite the fact that they, like persons of recent Asian ancestry, are likely to flush following alcohol use.

Wolff's research led to widespread interest in establishing the relationship of flushing to alcohol use and various symptoms following alcohol use. There are a number of questions to be answered with regard to the flushing response and its association with alcohol use. For example:

1. How many kinds of flushing are there? Is flushing related to dosage? Are there individual differences in the speed, intensity, and duration of flushing?
2. Does flushing (or a particular kind of flushing) reduce alcohol intake?
3. What are the genetic bases of flushing, and if there are different kinds of flushing, what are the genetic bases of each kind of flushing response? Is the flushing of persons of Mongoloid ancestry different from that of Caucasoids?
4. What differences are there in alcohol metabolism across groups that do and do not flush and groups that vary in types of flushing response?

These are the types of questions which are addressed in this paper. In addition, the issue of whether flushing protects individuals from becoming problem drinkers is discussed along with the potential utility of this information in combating alcoholism. The study of flushing may lead to an understanding of genetic bases of individual differences in flushing and alcohol metabolism, but may be of questionable value in decreasing risk. A substantial amount of the information presented below comes from research conducted at the Behavioral Biology Laboratory at the University of Hawaii, using two major samples as described below.

Method

The First Survey Sample

The first survey sample consisted of 3,714 persons residing on the island of Oahu. The respondents were adults of Chinese, Japanese, Filipino, Caucasian, and Hawaiian (or Part-Hawaiian) ancestry as well as mixed Oriental and Caucasian (Hapa haole) ancestry. Hapa haole refers here specifically to persons who reported one Caucasian parent and one Oriental (Chinese, Korean, or Japanese) parent. The survey was designed to minimize social class differences between the groups by sampling each group equally across low, medium,

Table 1.—Number of respondents in the first sample by ethnicity and sex

Ethnic group	Men	Women	Total
Caucasian	420	236	656
Chinese	452	223	675
Filipino	407	248	655
Hapahaole	230	213	443
Hawaiian or Part-Hawaiian	411	229	640
Japanese	418	227	645
Total	2,338	1,376	3,714

and high income census districts; however, the income levels of the groups differed. Persons of Chinese and Japanese ancestry were about equal in terms of income level and had the highest mean and median incomes of the five major ethnic groups in Hawaii. (No data on income were available for Hapa haoles.) Persons of Caucasian ancestry were intermediate in mean income level, while persons of Filipino and Hawaiian ancestry were nearly the same in mean income level and the lowest of the five groups (Johnson 1984).

Interviewers approached preselected households and left a questionnaire for each resident, provided that the individual was 1) a member of one of the six ethnic groups, 2) at least 20 years old, and 3) a resident of Oahu. The interviewer returned the next day to retrieve and check the completed questionnaire and to pay each respondent $5 for participating. At least 10 percent of the questionnaires were verified by telephoning the household to inquire whether the respondent had completed the questionnaire personally. If any questionnaire failed this test, all of that interviewer's work was checked.

The ethnic background and sex of the subjects in the first survey are shown in table 1. The actual sample differed from that originally planned in that the Hapa haole group had almost an equal number of men and women and a high proportion of persons age 30 and under relative to the other groups. It was difficult to obtain the proper mix of adult Hapa haoles because cross-ethnic relations between persons of Asian and European ancestries were far less frequent a generation or more ago than at present. For this same reason, all groups except the Hapa haoles where closely matched in age. Approximately twice as many Hapa haoles (74 percent) were under age 30, whereas the median percentage under age 30 for the other five ethnic groups was 36 percent. The differences in the sex ratio and the age of the Hapa haoles from the other groups probably result in an underestimate of the extent of Hapa haole drinking, since alcohol studies generally report that men drink more than women and fewer of the Hapa haoles had reached the peak drinking age of our sample.

The first survey asked a number of questions regarding the quantity and frequency of alcohol use but only one question regarding flushing ("Do you flush following the use of alcohol?"). Responses to the questions concerning alcohol use were converted into a quantity-frequency (QUAFRE) measure vis-a-vis Wilson et al. (1978).

The Second Survey Sample

The second survey sample consisted of 1,853 individuals residing in Hawaii, Taiwan, and Korea who reported that they had used alcohol or were current users. Subjects were obtained by student case finders from university classes in Hawaii, Taiwan, and Korea. This method may have introduced a social class bias into the sample; however, there does not appear to be an association between socioeconomic status and the flushing response.

Data were obtained from the subjects to determine whether they used alcohol, and if they drank, how much they usually consumed. They were also asked whether they flushed, and if they flushed, how many drinks were required to evoke flushing and whether they avoided drinking because of their flushing. Family data were obtained from respondents in the second survey only when the data were available for both parents of the respondent and at least one biological offspring (or sibling), all of whom had used alcohol at some time. There were 348 such families; for 301 of these, data also were obtained on the extent and duration of flushing as well as any other symptoms they experienced besides flushing. The ethnic backgrounds of respondents and their family members in the second survey are shown in table 2.

Data from these two surveys as well as from the reports of other researchers are presented below as they relate to the research questions stated earlier on flushing and alcohol use.

Results and Discussion

Flushing Types

A major research issue concerns the identification of various flushing types. Prior studies have been consistent in dividing subjects into groups according to whether or not they flush, but have not differentiated flushing types. In order to distinguish the types of flushes, the present research made use of self-report data. The flushing response is a common and observable phenomenon, and self-reports from Asians are thought to be quite accurate. Sanders et al. (1980) utilized both photometric and self-report data and found that persons who flush nearly always reported that they flushed. Further, this belief is supported by a high degree of correspondence between Wolff's (1972, 1973) photometric measures and self-report data from earlier work (Wilson et al. 1978). It is worth mentioning, however, that a major data gap could be filled by obtaining self-report as well as photometric data from a large number of persons participating in alcohol challenge sessions.

As mentioned earlier, the second survey collected family data regarding flushing and alcohol use; these data were used to assess family resemblances in flushing as well as the association of flushing and alcohol use (Schwitters et al. 1982*b*). It became clear upon data analysis that there were two types of flushing: fast flush (FF) and slow flush (SF). A fast flush was operationally defined as flushing after one drink or less of an alcoholic beverage, and a slow flush was defined as flushing after two or more drinks. As will be discussed later in this chapter, the fast flush and slow flush both differed in their frequencies across racial/ethnic groups, as well as in their patterns of family resemblance.

Flushing and Alcohol Use

Another question to be addressed is that of the association of flushing, or of flushing type, with alcohol use. Early findings from the alcohol survey showed that persons of Chinese and Japanese ancestry reported substantially higher frequencies of flushing and substantially less use of alcohol than did persons of European ancestry. Hapa haoles flushed like persons of Oriental ancestry and drank like persons of European ancestry. A later report of this alcohol survey data (Schwitters et al. 1982*b*) contrasted the quantity and frequency of the use of beer, wine, and distilled spirits among flushing versus nonflushing respondents by sex and ethnic group. Although a significant association was found between flushing and frequency of drinking for men (but not women) of Japanese ancestry, there were no significant associations between flushing and quantity of beer, wine, or distilled spirits consumed for either sex.

As all previous research would indicate, there are substantial differences in alcohol use across racial/ethnic groups and across sexes within racial/ethnic groups. Within given sexes and racial/ethnic groups, the differences in alcohol use between persons who did flush and those who did not were almost always insignificant or had a trivial level of statistical significance. The alcohol survey data confirm Wolff's reports (1972, 1973) of substantial racial/ethnic differences in flushing and of the resemblances of persons of mixed ancestry to Orientals in their flushing responses. As noted above, the close similarity of data obtained through photometric techniques following an alcohol challenge and self-report data supports the belief that self-reports of flushing are reasonably accurate. However, within sexes and racial/ethnic groups, flushing as measured (flush/no flush) was basically unrelated to alcohol use except for Japanese American males. In this group, flushers drank less frequently than did nonflushers.

The lack of differences between flushers and nonflushers in alcohol use within groups, combined with the substantial group differences in alcohol use and in flushing (with the frequency of flushing across groups substantially negatively correlated with amount of alcohol used across groups), led us to further study the flushing response and alcohol use, using more sensitive measures of flushing. As mentioned earlier, flushing following alcohol use is by no means limited to persons of Asian ancestry. Wolff's (1972) results seemed in all likelihood to have resulted from the very low alcohol intake of the subjects in his alcohol challenge sessions. Thus, it seemed possible that flushing per se might have little influence on alcohol use, but that the amount, extent, and duration of flushing as

Table 2.—Number of family members and families by country and ethnicity in the second sample

	Hawaii, by ethnicity								
	Caucasian	Chinese	Filipino	Hawaiian/ Part Hawaiian	Japanese	Other	Total	Korea	Taiwan
Family member[a]									
Father	50	33	38	18[c]	153	15	307	81	96
Mother	44	31	24	27[c]	162	19	307	42	72
Son	28	15	42	34[c]	93	42	254	101	82
Daughter	48	31	34	51[c]	199	57	420	25	66
Total	170	110	138	130[c]	607	113	1,288	249	316
Complete families[b]	36	17	16	28[c]	119	29	245	40	63

[a] Individuals who reported having used alcohol.

[b] Families in which both parents and at least one offspring reported having used alcohol.

[c] Families in which one parent was Hawaiian and the other parent was of any other group are classified as Hawaiian/Part-Hawaiian.

well as the amount of alcohol required to evoke flushing might influence alcohol use. Further, family resemblances in the flushing response needed to be assessed.

On the basis of early survey findings (Schwitters et al. 1982b), it was concluded that fast flushing and slow flushing were somewhat different phenomena; consequently, analyses were performed in terms of no flush (NF), slow flush (SF), and fast flush (FF). The data from Hawaii (all ethnic groups combined) indicated that about 10 percent of slow flushers and 30 percent of fast flushers stated that they avoid drinking because of their flushing. When they do drink, there are small but significant differences in consumption across NF, SF, and FF groups in 7 of 18 comparisons (6 ethnic groups x 3 kinds of alcoholic beverages–beer, wine, and distilled spirits). The only group whose members showed a consistent difference across all three types of alcoholic beverages were those of Japanese ancestry, where NF and SF consumption was almost identical and the FF group drank less (Johnson et al. 1984).

The associations between flushing and alcohol use were also obtained for homeland Koreans and for Taiwan Chinese (Park et al. 1984). Chinese from Taiwan are very low in mean alcohol use, and flushing had a significant but basically trivial association with alcohol use. Homeland Koreans who use alcohol are heavy drinkers–heavier, in fact, than the Caucasian and Hawaiian/Part-Hawaiian groups, who are the heaviest drinking groups in Hawaii. Korean alcohol consumption is substantially related to flushing type. In both the Taiwanese and the Korean samples, the differences in consumption were between the FF group and both the NF and SF groups, although the NF and SF groups did not differ in consumption from one another.

Aside from the present research, one other extensive study of flushing and drinking behavior has been reported. Suwaki and Ohara (1985) found that of 2,035 homeland Japanese males, 1,649 used alcohol, and of these persons, 50.9 percent flushed and 48 percent did not flush; no information was available for the other 1.1 percent of subjects. Suwaki and Ohara did not categorize their subjects into flushing types, but the Hawaii alcohol study indicated that among Japanese who flush, over two-thirds are fast flushers. Among these subjects, nonflushers drank more often and drank more sake than flushers. Differences, while significant, were comparatively small. Flushers enjoy drinking but prefer to drink beer, which is substantially lower in alcoholic content than sake (Suwaki and Ohara 1985).

Flushing appears to influence alcohol consumption, but only under relatively circumscribed conditions. It is only FF, and not SF (and SF is by far the most common flushing type in many groups), that has an effect on the alcohol consumption of any sizable number of persons. This effect, though significant, is trivial in groups where the normative use of alcohol is low (Hawaii and Taiwan Chinese). The effect is relatively slight among moderate users (Hawaii Japanese) and is substantial only in the group with the heaviest alcohol use of all groups studied (homeland Koreans). The reader is reminded, however, that a very substantial number of Koreans do not use alcohol at all; nonetheless, if they drink, they tend to be heavy users of alcohol.

Wolff (1973) suggested that flushing led to a reduced alcohol intake only in relatively intact cultures. The present data suggest that flushing is associated with reduced consumption only for fast flushers in relatively intact cultures with a high normative rate of alcohol consumption.

Possible Genetic Bases of Individual Differences in Flushing

Another key question to be considered is that of the genetic bases of individual differences in the flushing response to alcohol. Pedigree data were obtained from a total of 348 families. Family members were instructed to complete their questionnaires independently of one another, and data from a subset of our subjects indicated that they did so. Distributions of flushing types across generations and across racial/ethnic groups, as well as family resemblances in flushing, are shown in table 3. These same data are compressed somewhat in table 4 in order to show more closely the differing degree of family resemblance across flushing types and across racial/ethnic groups.

These data demonstrate what is well known: a higher proportion of persons of Mongoloid than other racial/ethnic groups flush. The data further show substantial differences across groups in fast flush versus slow flush, with all Mongoloid groups, except Koreans, usually demonstrating fast flush if they flush. Members of non-Mongoloid or mixed (i.e., Filipino, Hawaiian/Part-Hawaiian) groups usually SF if they flush at all; it is FF, not flushing, per se, that has even a limited apparent "immunizing" effect with regard to alcohol use.

An initial examination of the data would support the position that flushing is influenced by an autosomal

Table 3.–Family resemblances in flushing by race/ethnicity and flushing type

	Parents		
Offspring	Neither flushes	One flushes, one does not	Both flush
Mongoloid sample			
Chinese (Hawaii)			
No flush	4	3	1
Slow flush[a]	1	0	1
Fast flush[b]	2	4	6
$\chi^2 = 4.60$, df = 4, n.s.			
Chinese (Taiwan)			
No flush	14	18	14
Slow flush	1	2	7
Fast flush	1	13	31
$\chi^2 = 20.30$, df = 4, $p < .001$			
Japanese			
No flush	44	58	21
Slow flush	8	19	13
Fast flush	3	23	28
Korean (homeland Korea)			
No flush	6	15	9
Slow flush	1	10	8
Fast flush	0	2	8
$\chi^2 = 9.75$, df = 4, $p < .05$			
Caucasian sample			
No flush	44	5	2
Slow flush	5	6	1
Fast flush	1	0	1
$\chi^2 = 19.08$, df = 4, $p < .001$			
Mixed sample			
Filipino			
No flush	30	9	0
Slow flush	3	0	1
Fast flush	0	0	0
$\chi^2 = 10.67$, df = 2, $p < .01$			

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[a] Slow flush: flush after two or more drinks.

[b] Fast flush: flush after one drink or less.

n.s. = not significant.

Table 3.—Family resemblances in flushing by race/ethnicity and flushing type—Continued

Offspring	Parents Neither flushes	 One flushes, one does not	 Both flush
Mixed sample—continued			
Hawaiian/Part-Hawaiian			
No flush	29	9	0
Slow flush	3	6	2
Fast flush	0	2	2
$\chi^2 = 23.04$, df=4, $p < .0001$			
Other[c]			
No flush	19	21	4
Slow flush	1	6	1
Fast flush	1	11	4
$\chi^2 = 9.94$, df=4, $p < .05$			
Total			
No flush	190	138	51
Slow flush	23	49	34
Fast flush	8	55	80

[c] Members of other groups tested in Hawaii (e.g., Koreans, Tongans, and persons of mixed ancestry).

dominant gene, with group differences in the flushing response (FF versus SF) possibly resulting from differences in expressivity. Further, it is entirely reasonable that some offspring of parents who reported that they did not flush might be slow flushers who never ingested enough alcohol to experience flushing. However, it is by no means as reasonable to believe that parents who had used alcohol and did not flush could have FF offspring, if flushing were carried as an autosomal dominant gene. The existence of fast flushing offspring with parents who do not flush argues against the idea that flushing is inherited as a single autosomal dominant gene unless there are vast differences in expressivity. Further opposition to a single gene interpretation is based on the different distribution (i.e., a "J" curve) of offspring flushing responses when one or both parents are SF as opposed to the bimodal distribution of offspring flushing across the NF-SF-FF categories when one or both parents are FF. Flushing seems to have a very high degree of heritability, but the genetic mechanism, probably involves a gene pair with incomplete dominance, two or more gene pairs, or some other genetic mechanism, but not a single autosomal dominant gene. While approximating the expected frequencies of resemblance that would be expected from the action of a single gene pair, available data strongly suggest a more complex mode of inheritance. The existence of polymorphisms in both of the two major liver enzymes influencing alcohol metabolism (alcohol dehydrogenase (ADH) and acetaldehyde dehydrogenase (ALDH)) further suggests that at least two gene pairs individually influence alcohol metabolism, including, in all likelihood, the flushing response.

Flushing and Alcohol Metabolism

The last issue to be addressed concerns the metabolic differences which exist among flush/no flush and between fast flush, slow flush, and no flush groups. Two approaches might be used in assessing metabolic differences between flushing groups, although both approaches provide inferential data. One approach is basically "molar" and behavioral and involves assessing the associations of flushing with other symptoms that accompany alcohol use. For example, if FF persons often experienced intensive hangovers following

Table 4. Family resemblances in flushing by major racial group and flushing type

	Parents		
Offspring	Neither flushes	One flushes, one does not	Both flush
Mongoloid sample[a]			
No flush	68	94	45
Slow flush	11	31	29
Fast flush	6	42	73
$^2=87.8$, df $=4$, $p<.001$			
Caucasian or mixed sample[b]			
No flush	103	23	2
Slow flush	11	12	4
Fast flush	1	2	3
$^2=43.6$, df $=4$, $p<.001$			

	No flush, no flush	No flush, slow flush	No flush, fast flush	Slow flush, slow flush	Slow flush, fast flush	Fast flush, fast flush
Total offspring[c]						
No flush	190	71	61	16	15	16
Slow flush	23	23	26	4	16	16
Fast flush	8	7	35	11	24	40
$^2=182.5$, df $=10$, $p<.001$						

	One or both parents:	
	Slow flush	Fast flush
Offspring[d]		
No flush	102	92
Slow flush	43	58
Fast flush	42	99
$^2=18.0$, df $=2$, $p<.001$		

[a] Mongoloid sample consists of Hawaii Chinese, Taiwan Chinese, Hawaii Japanese, and homeland Koreans.

[b] Caucasian or mixed sample consists of Hawaii Caucasians, Filipinos, and Hawaiians/Part-Hawaiians. "Others" are excluded since some of these are Hawaii Koreans; many of the "others" are of mixed Mongoloid-Caucasoid ancestry.

[c] Total includes the "other" category (i.e., members of other groups tested in Hawaii—Koreans, Tongans, and persons of mixed ancestry).

[d] Offspring of slow flush/fast flush parents are double-counted (i.e., entered into both the slow flush and fast flush categories): 48 percent of the Mongoloid offspring flush (18 percent slow flush and 30 percent fast flush), and 20 percent of the Caucasoid and mixed offspring flush (18 percent slow flush and 2 percent fast flush).

alcohol use, and NF and SF persons did not, this information would be useful in accounting for the differences between NF/SF and FF persons in their alcohol consumption. Further, this difference would be informative in predicting the existence of associations between metabolic pathways and flushing. The second approach is a comparatively "molecular" perspective to the assessment of the association of flushing with alcohol metabolism and involves the examination of enzyme polymorphisms across flushing groups. Persons of Asian ancestry flush more and drink less than do persons of Caucasian ancestry in Hawaii. It is widely assumed that persons of Caucasian ancestry drink more because they can "take it better" either because of some genetic disposition or because of habituation. The present alcohol survey included a set of questions concerning symptoms (e.g., flushing, hangovers, numbness in hands and feet) and problems (e.g., work affected by drinking, problems with relatives due to drinking).

Symptoms and problems increase as the quantity-frequency of alcohol use goes up. However, within QUAFRE categories, there are only slight differences between ethnic groups, differences that do not always support the contention that Caucasians have fewer symptoms or problems (Schwitters et al. 1982*a*). The point biserial correlation of flush/no flush with the total number of other symptoms reported is only 0.11–highly significant, given the sample size, but trivial in any real world sense.

Suwaki and Ohara (1985) also have reported on the association of flushing with other symptoms. Flushers get sleepy more often, whereas nonflushers have more accidents and fights while drinking, as well as more problems with household economics and with their spouses. Data regarding the association of flushing with other symptoms also came from the Hawaii flushing study. Subjects were asked whether they flushed and, if so, the number of drinks required to evoke flushing and the amount and duration of flushing. Persons who flushed were also asked to report on the frequency with which they experienced other symptoms (e.g., "heart beats faster," "break out in hives," "breathe faster"). The principal interest here was in discovering whether the two types of flushing were differentially associated with other symptoms. Unfortunately, comparable data from persons who did not flush were not obtained. This shortcoming, however, is partially remedied by the data of Suwaki and Ohara discussed above.

The data provided by the SF and FF groups are presented in table 5. These data suggest that FF is more closely associated with other symptoms than is SF, but that the differences in association are manifested only in groups that are relatively high in flushing rate and in alcohol consumption. The associations of flushing type with other symptoms frequently are relatively weak, which might account for the data indicating that flushing has only a small inhibitory effect on alcohol use.

Upon examining the enzyme systems that influence such metabolism, it is known that two major liver enzymes, alcohol dehydrogenase (ADH) and acetaldehyde dehydrogenase (ALDH), are principally involved in alcohol metabolism. Both of these enzyme systems exhibit genetic polymorphisms. Differences in alcohol use suggest a genetic basis for individual and group differences in alcohol metabolism that in turn influence alcohol consumption. There is much literature on this topic, most of which compares Mongoloid-Caucasoid ADH and ALDH metabolism with flushing as well as other alcohol-related symptoms. Thorough reviews of this literature include those of Schaefer (1978) and Dietrich and Spuhler (1984). The reader also is referred to the paper by Agarwal et al. (1984), which was too recent to be included in the Dietrich and Spuhler review.

Nearly all of the reports of group differences in ADH and ALDH activity and associated symptoms such as flushing have been based on data obtained from the livers of cadavers. It now is possible to assess enzyme activity through the use of hair follicles (Goedde et al. 1980) or through cell ALDH activity (Inoue et al. 1980). The literature indicates substantial racial/ethnic differences in ADH and ALDH enzymes between Mongoloids and Caucasoids. About 50 percent of Mongoloids do not have the ALDH I isozyme, a deficiency that results in impaired acetaldehyde oxidation leading to facial flushing and to other cardiovascular symptoms (Agarwal et al. 1984). In their literature review, Deitrich and Spuhler (1984) found that flushing existed only among individuals lacking in what Agarwal et al. refer to as ALDH I. Both individual and racial differences in enzyme activity appear to have genetic bases. These differences are related to flushing, to other symptoms, and to drinking behavior (Mizoi et al. 1979, 1980; Harada et al. 1980, 1981, 1982).

Table 5.—Percentage of slow flushers versus fast flushers who report symptoms or responses to alcohol

	Hawaii sample Caucasian, mixed[a]		Hawaii sample Mongoloid[b]		Korean sample		Taiwanese sample	
Symptom or response	Slow flush	Fast flush	Slow flush	Fast flush	Slow flush	Fast flush	Slow flush	Fast flush
Face turns pink/red	95	100	99	100***	98	100***	82	92*
Body turns pink/red	34	25	31	59***	31	57***	25	37*
Limbs turn pink/red	25	0	19	40***	22	50***	18	24*
Heart beats faster	46	55	54	73***	58	75***	70	71*
Break out in hives	2	10	7	13***	3	10***	7	11*
Breathe faster	19	11	21	30***	32	55***	53	51*
Get dizzy	27	20	24	26***	37	59***	56	53*
Get headaches	17	27	19	27***	36	61***	33	39*
Get nauseous	16	0	10	16***	29	39***	11	20*
Feel tingling	36	20	32	30***	—	—***	—	—*
Feel warm	90	100	93	95***	75	74***	84	77*
Feel lightheaded	42	40	56	45***	43	52***	34	36*
Feel sleepy	52	67	50	53***	58	35***	69	73*
Avoid drinking because of flushing	7	23	11	33***	15	57***	23	37*
Continue to drink after flushing	68	46	61	42***	69	11***	45	37*
Average duration of flushing (minutes)	37	42	64	61***	74	57***	61	65*
N[c]	(42)	(13)	(75)	(132)**	(101)	(53)**	(57)	(142)

[a] Caucasians, Filipinos, and Hawaiian/Part-Hawaiians.

[b] Chinese and Japanese.

[c] Sample sizes are reduced due to missing data.

*$p < .05$.

**$p < .01$.

***$p < .001$.

Conclusions

The Flushing Response and Its Relation to Alcohol Use

More persons of Mongoloid ancestry than of Caucasoid ancestry flush, although persons of Mongoloid ancestry drink less than do people of Caucasoid ancestry. Whether or not an individual flushes is only weakly associated with the presence or absence of other symptoms or with alcohol use. Individuals who do not flush or who slow flush do not differ in amount used, while FF subjects of Korean ancestry and, to a lesser degree, of Japanese ancestry drink less than NF or SF members of their respective groups. There seems to be strong evidence that flushing is associated with polymorphisms influencing alcohol metabolism. Family survey data show a very high degree of family resemblance in flushing. It appears that more than one gene pair is involved in the inheritance of flushing. There are differences in the proportion of NF/SF/FF subjects among persons of Chinese, Japanese, and Korean ancestry, as well as group differences in alcohol use and in the association of flushing with other symptoms. These differences advise against collapsing these ethnic groups into categories such as "Asian" or "Mongoloid."

Issues Which Still Need to Be Addressed

Studies on the flushing response employ various methodologies for ascertaining whether individuals flush following alcohol use. Obtaining photometric measures of skin reflectance following alcohol challenge sessions is clearly the most accurate way of measuring the flushing response. However, obtaining this type of family data to assess genetic bases of individual differences in flushing would not only be expensive but logistically difficult. On the other hand, family survey data are fairly simple and inexpensive to obtain. While one can be reasonably confident that most respondents respond accurately in self-reports, it is important to obtain both photometric and self-report data concerning flushing from the same individuals to ascertain the accuracy of self-reports.

In addition, blood samples and/or hair follicle samples should be obtained from the same subjects in order to assess differences in ADH and ALDH metabolism associated with photometric and self-report measures of flushing. Alcohol challenge sessions could be designed which involve the ingestion of enough alcohol so that SF subjects would have the opportunity to flush if they were going to do so. Such sessions might entail, for example, the ingestion of the equivalent of about 3 ounces of 90 proof alcohol within a fairly brief time interval. It is also desirable to obtain data on the extent and duration of flushing and the presence or absence of other symptoms (such as those shown in table 5) from these alcohol challenge session subjects. There is a large amount of available data on self-reported flushing, photometric measures of flushing, and genetic polymorphisms influencing ADH and ALDH metabolism. Still, very few individuals have been assessed on more than one of these three measures, and no subjects have been assessed on all three.

Implications of Findings on the Flushing Response

Data suggest that flushing per se has relatively little influence on alcohol use. However, some persons either avoid drinking altogether because they flush or stop drinking once they do flush. Ghiselli (1964), an industrial psychologist, was the first to show a real concern for what he called "moderator variables." The usual correlation between predictor measures and outcome measures such as job performance is about +0.30. Ghiselli found that this comparatively low correlation occurred because the predictor measures have a high association with outcome for a subset of individuals and essentially no association with the outcome measure for other individuals. It is possible, by examining those persons whose scores fall on and off the regression line, to establish those groups for whom the predictor variables have validity in terms of outcome.

For example, it seems likely that cigarette smoking greatly increases the risk for the development of emphysema for those persons who are homozygous for a given genetic attribute (an antitrypsin deficiency) and perhaps for heterozygous carriers of the deficiency, but not for others (Brewer 1985). Thus, it appears predictable that some persons are at greater risk than others and that others are not at any risk: the moderator variables set the factors that interpret levels of risk.

Flushing per se is not much of an immunizer. In fact, data from the alcohol survey show that Japanese and Chinese women under 30 have increased their use of alcohol more than women of the same racial/ethnic group age 40 and over. This situation holds true despite the fact that the women under 30 are more likely to be fast flushers. Yuen and Johnson (1985) presently are obtaining data from 100 mother-daughter pairs of Japanese Americans and 100 mother-daughter pairs of Caucasian Americans in order to assess the association of physiological (e.g., flushing, other symptoms), familial (e.g., family drinking patterns, with a special emphasis of maternal alcohol use), and sociological (e.g., cross-ethnic dating) variables influencing generational differences, with a special concern for "moderator variables."

In and of itself, flushing is not of much value in understanding risk, although it is clear that some flushers avoid drinking alcohol altogether or at least cease to drink once they do flush. One would expect those flushers whose flushing is associated with other symptoms–perhaps those flushers with given kinds of ADH and/or ALDH enzyme activities–to be influenced in alcohol use by flushing, while others are not. It should be possible to ascertain, in advance, those persons who are or are not at risk through an assessment of flushing in conjunction with moderator variables.

Our own data, so far, have convinced us that racial/ethnic differences in alcohol use are not a consequence of group differences in tolerance (Schwitters et al. 1982*a*) or in problems associated with alcohol use (Johnson et al. 1985). Our data (Foch et al. 1984; Johnson et al., 1985) suggest that groups differ in their normative use of alcohol and that the higher the level of normative use, the higher the frequency of problem drinking and of alcoholism. While group differences in enzyme activity (and in flushing) may influence alcohol-related behaviors, this influence seems relatively minor compared with sociological influences. Even so, an assessment of the influence of flushing, in conjunction with an assessment of moderator variables, might provide us with useful information about individual risk.

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V.
National Data Presentations

Alcohol Use and Abuse Among U.S. Minority Groups: Results From the 1983 National Health Interview Survey

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ABSTRACT

Data from the 1983 National Health Interview Survey (NHIS) are used to compare levels of drinking among men and women of white non-Hispanic, black non-Hispanic, and Hispanic backgrounds. Drinking levels (abstinence, light, moderate, and heavier) are examined in terms of sociodemographic characteristics that seem to influence drinking and in terms of selected drinking consequences such as self-reported health status, problems associated with drinking, and adverse health conditions. Results suggest that, among the racial or ethnic groups and sex groups, each selected sociodemographic variable tends to relate to the drinking levels in a similar way. Heavier drinkers report more lifetime problems associated with drinking, whereas moderate drinkers report a better health status and fewer adverse health conditions than either abstainers or heavier drinkers. Further research using the 1983 NHIS is suggested to examine the determinants of drinking levels and their consequences.

Introduction

Alcohol abuse is a national health problem that affects Americans of all ages, backgrounds, and circumstances. It has been estimated that (1) 10 percent of Americans who drink are either alcoholics or problem drinkers (U.S. Department of Health and Human Services [DHHS] 1983), (2) between one-third and one-half of all accidents, crimes, and suicides involve alcohol (DHHS 1985), and (3) the economic costs of alcohol abuse to society in 1983 may have reached $116.7 billion (Harwood et al. 1984).

It is not known how these staggering estimates of human and economic costs of alcohol abuse relate to different minority groups. Other researchers (e.g., Alcocer 1982; Cahalan et al. 1969; King 1982) suggest that abstinence, drinking patterns, and the consequences of alcohol abuse can vary considerably among various racial or ethnic groups in our society. Unfortunately, our knowledge even about the prevalence of alcohol use among many minorities is quite limited.

Purpose of the Paper

The purpose of this paper is to examine racial and ethnic differences in alcohol use and abuse on the basis of data from the 1983 National Health Interview Survey. Specifically, this paper will examine the following:

1. Levels of drinking (abstinence, light, moderate, and heavy) by sex among selected racial and ethnic groups in the U.S. population.
2. For each racial and ethnic group, the associations of various sociodemographic characteristics that seem to influence drinking patterns (i.e., age, marital status, education, family income, employment status, and geographic region).
3. Selected consequences of drinking among each of the racial and ethnic groups (i.e., self-reported health status, personal problems associated with drinking, and health conditions).

Limitations

The NHIS utilizes a national sample based on probability-proportional-to-size (PPS) sampling. Consequently, only very small numbers of certain minorities (i.e., Asians, Pacific Islanders, and Native Americans) are included to reflect their proportion in the U.S. population. Many analyses that can be performed for whites, blacks, and Hispanics by using NHIS data, therefore, cannot be conducted reliably for other racial and ethnic groups.

The drinking levels used in this paper (abstinence, light, moderate, and heavier drinking) are based on an individual's average daily ethanol (absolute alcohol) consumption. It is important to note that the term "heavier drinker" is relative to the other drinking levels and does not necessarily mean excessive or problem drinking.

Finally, in order to compare drinking levels across sex and racial and ethnic groups, it was necessary in the analyses to collapse response categories on the sociodemographic and health status variables. Such collapsing may mask certain differences which would be apparent if finer distinctions in the response categories were possible. However, relatively small numbers in some of the cells prohibited more detailed categories. Weighted percentages are not presented for any cell containing fewer than 15 cases.

Methods

Data Source

The data source for this study was the Alcohol/Health Practices Questionnaire of the 1983 NHIS. This questionnaire is the most recent and the largest single source of data available that provides extensive and detailed information on alcohol consumption. The alcohol questionnaire–a cooperative effort between the National Institute on Alcohol Abuse and Alcoholism and the National Center for Health Statistics (NCHS)–was administered in 1983 to 22,418 individuals in a household sample of the noninstitutionalized civilian population. All respondents to the alcohol questionnaire were at least 18 years of age.

The Alcohol/Health Practices Questionnaire and the routine health items of the 1983 NHIS contain a variety of questions concerning drinking practices, drinking problems, self-reported health status, health practices, and health conditions. Together, responses to these questions provide information on a broad range of health variables from which national prevalence and incidence estimates can be made, including estimates for selected minority groups. Data from the NHIS and the alcohol questionnaire, which are now available on public use tapes, offer researchers an extensive array of alcohol, demographic, and health variables from which hypotheses about alcohol use and its consequences can be examined.

Racial and Ethnic Groups

The alcohol questionnaire sample included 19,797 whites, 2,137 blacks, 130 Native Americans (i.e., American Indians, Eskimos, and Aleuts), 343 Asians (including Pacific Islanders), and 11 persons for whom race could not be determined. Hispanic origin (independent of race) was reported by 1,392 of the respondents. The racial and ethnic groups in this investigation were constructed by using self-reported race and Hispanic origin. Interviewer observations were substituted for race only to resolve problems of nonresponse and multirace codes (NCHS 1985).

Except for an overview of the drinking status of all the racial and ethnic groups classified in the NHIS, the groups used for this analysis are (1) white, non-Hispanic, (2) black, non-Hispanic, and (3) Hispanic.[1] The ethnic category Hispanic includes white, black, Native American, and Asian respondents, since precedence was given to Hispanic origin in the racial and ethnic algorithm. Ninety-three percent of the Hispanic respondents were white, 4.2 percent were black, 1.6 percent were Native American, and 1.2 percent were Asian.

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[1] Use of mutually exclusive groups was implemented after conference participants expressed concern that racial and ethnic categories often are confounded in alcohol research. Analyses presented at the conference used white, black, and Hispanic groups that were not mutually exclusive. However, the new prevalence estimates in this paper do not vary by more than 1 or 2 percent from those presented previously.

Alcohol Consumption and Drinking Levels

As reported in this paper, alcohol consumption represents combinations of responses on how frequently each respondent drank and in what quantity. Item responses on quantity and frequency of consumption (QF) were multiplied together (based on data for a 2-week reference period) for beer, wine, and spirits separately. The resulting volume measures were then converted to absolute alcohol, summed, and averaged for the 14-day period to represent an individual's total average daily consumption expressed in ounces of ethanol. The ethanol conversion coefficients were 0.045 for beer, 0.15 for wine, and 0.45 for spirits.

To construct the drinking levels, ranges of average daily ethanol consumption were used to classify drinkers into abstainer, light, moderate, and heavier drinking groups. The drinking groups are defined as follows: abstainers–fewer than 12 drinks in any single year or no drinks within the past year; light drinkers–average daily consumption of 0.01 to 0.21 ounces of ethanol (up to 3 drinks per week); moderate drinkers–average daily consumption of 0.22 to 0.99 ounces of ethanol (4 to 13 drinks per week); and heavier drinkers–average daily consumption of 1 or more ounces of ethanol (2 or more drinks per day).

Both the conversion coefficients and the cut points for the drinking levels were developed by Johnson et al. (1977) in analyzing 1971 to 1975 drinking trends from a variety of national surveys. The same drinking levels have been used more recently by other researchers (Clark and Midanik 1982; Wilsnack et al. 1984). Williams et al. (1985) suggested that the reliability of the QF estimates from which the drinking levels are constructed is quite high from test/retest, alternate forms, and retest/alternate forms methods of examining reliability.

Weighted Data

Since national prevalence estimates were of primary interest for this paper, the data have been weighted to represent the U.S. civilian noninstitutionalized population aged 18 and older using the NCHS weighting methodology (NCHS 1985). Statistical tests, however, were conducted on unweighted data. Finally, results in this paper are presented for males and females separately because these data as well as previous research indicate substantial differences between men and women both in total alcohol consumption and in drinking patterns.

Results

Table 1 presents the percentage of drinkers by sex and the total percentage for all the racial and ethnic groups responding to the 1983 alcohol questionnaire. For this table only, the racial and ethnic groups are not mutually exclusive. The data in table 1 are based on the NHIS screening questions used to determine whether respondents were drinkers. The data are shown to give readers a view of the size of the drinking samples for each racial and ethnic group. The largest differences in drinking for both men and women are between whites and the other groups, with white males and females more likely to be drinkers than other males and females. The percentage of drinkers among male Hispanics and male Native Americans was somewhat lower than expected.

Table 2 presents the distributions of the constructed drinking levels for the mutually exclusive white non-Hispanic, black non-Hispanic, and Hispanic groups (hereafter referred to as white, black, and Hispanic). The percentages of drinkers from the combined drinking categories in table 2 do not correspond exactly to the data on drinkers presented in table 1. Minor discrepancies in the percentages occur because of missing data on the QF items in the alcohol questionnaire; in other words, some respondents reported that they were drinkers but they did not provide later QF information. Regardless of sex, whites are most likely to be drinkers, blacks are least likely, and Hispanics are in the middle.

Table 2 also presents percentage distributions of drinking levels for drinkers only. Chi-square analysis of the unweighted data within each sex group indicated no significant ($p < .05$) racial and ethnic differences in the levels of drinking among drinkers only. Thus, the racial and ethnic differences in drinking patterns among both males and females appear largely due to differences in the rates of abstinence, not to light, moderate, and heavier drinking.

Table 1.—Percentage of drinkers by racial/ethnic group and sex

Race/ ethnicity	Drinkers[a] Males	Females	Total	Total sample[b]
White	75	54	64	87.1
N	(6,348)	(6,004)	(12,352)	(19,797)
Black	59	34	45	10.7
N	(478)	(461)	(939)	(2,137)
Native American	49	45	47	.6
N	(23)	(40)	(63)	(130)
Asian	51	24	38	1.6
N	(81)	(43)	(124)	(343)
Total	73	51	61	100.0
N	(6,930)	(6,548)	(13,478)	(22,407)
Hispanic[c]	69	36	51	6.2
N	(405)	(261)	(686)	(1,392)

Note: Weighted percentages.

[a] Drinkers are defined as persons who reported having had both 12 or more drinks in any 1 year and at least 1 drink within the past year. Drinking status was indeterminant for 60 respondents in the racial categories and 5 respondents of self-reported Hispanic origin.

[b] A racial/ethnic classification could not be determined for 11 respondents.

[c] Hispanic origin in this table is not mutually exclusive from the racial categories.

Previous research suggests that, in addition to racial and ethnic characteristics, drinking patterns vary considerably by other sociodemographic factors. Table 3 presents the drinking levels of males according to race/ethnicity and selected sociodemographic characteristics. Although the strength of the associations with the different sociodemographic characteristics varies by race/ethnicity, it is important to note that within each racial and ethnic group the six characteristics tend to relate to drinking levels in a similar way. That is, drinking tends to decrease with age; separated and divorced men are more likely to be heavier drinkers than are married and never-married men. Also, drinking levels increase with higher levels of education and, to some extent, with increasing family income.

Results also suggest that unemployed black and white males are heavier drinkers than employed males, although abstinence rates do not differ within the two groups. Southern white men are less likely to be drinkers than are white men in other regions of the United States. However, for black males, the largest regional difference among drinking levels appears to be in the West. The drinking levels of Hispanic males are nearly identical to whites in the South and West.

Table 4 presents information on sociodemographic characteristics and drinking levels for females. Because of the small number of heavier drinkers among black and Hispanic women, prevalence figures on heavy drinking usually could not be presented for these groups. Generally, similar associations with the sociodemographic variables were found with women as with men by the racial and ethnic categories. For example, abstinence was related positively to age and negatively to more years of school completed and increasing family income.

The importance of the findings in tables 3 and 4 is that drinking levels among the racial and ethnic groups appear to be related similarly to the selected sociodemographic characteristics, suggesting that race and ethnicity may not be as important as other sociodemographic characteristics in determining levels of drinking. This hypothesis has not been tested fully for the present study, but such a result would support King's (1982) suggestion that drinking patterns tend to reflect

Table 2.–Percent distribution of drinking levels for total sample and drinkers only by racial/ethnic group, sex, and total

	White (non-Hispanic)		Black (non-Hispanic)		Hispanic	
Drinking levels[a]	All	Drinkers only	All	Drinkers only	All	Drinkers only
Males						
Abstainer	25	–	43	–	33	–
Light drinker	29	39	23	41	25	37
Moderate drinker	29	38	21	38	27	40
Heavier drinker	17	22	12	22	16	28
N	(7,821)	(5,776)	(752)	(423)	(562)	(379)
Females						
Abstainer	46	–	68	–	66	–
Light drinker	32	60	21	65	22	65
Moderate drinker	17	31	9	26	9	27
Heavier drinker	5	9	3	9	3	7
N	(10,194)	(5,498)	(1,248)	(414)	(778)	(260)
Total						
Abstainer	36	–	57	–	51	–
Light drinker	31	49	22	51	24	47
Moderate drinker	22	35	14	33	17	35
Heavier drinker	10	16	7	16	9	17
N	(18,015)	(11,274)	(2,000)	(837)	(1,340)	(639)

Note: Weighted percentages. Column percentages may not add to 100 because of rounding.

[a] Drinking levels are defined by quantity-frequency (QF) measures used to compute average daily ethanol consumption. Missing data or unknown codes on some QF items precluded the estimation of light, moderate, or heavier drinking levels for 325 survey respondents. A total of 840 males and 541 females in the abstainer category were "former drinkers"; i.e., they drank more than 12 drinks a year at one time but had not had a drink in over a year.

socioeconomic status more than minority group membership. Since there are still large differences in drinking levels among the racial and ethnic groups (even when controlling for various sociodemographic variables), the relative contribution of race and ethnicity versus other sociodemographic characteristics to drinking needs to be examined more completely.

Table 5 presents the percentage distribution of self-reported health status for the racial and ethnic groups by drinking level and sex. As might be expected, health status varied among the racial and ethnic groups, with whites, both male and female, having a better self-reported health status than blacks. Females in each racial and ethnic group were more likely than their male counterparts to report that their health was fair or poor.

Particularly interesting in this table is the finding that, except for Hispanic females, moderate drinkers tended to have a better self-reported health status than any other drinking category, regardless of race or ethnicity. This finding reflects the familiar U-shaped phenomenon in the relationship of drinking level to health status. Alcohol research frequently indicates that moderate drinkers tend to have lower mortality and morbidity rates and tend to be in better health than either abstainers or heavier drinkers (e.g., Marmot et al. 1981).

The results in table 5 suggest that there may be some health benefits to moderate drinking. Other factors, however, such as lifestyle and health practices may confound the relationship of drinking levels to health status. These data are not controlled for age or

Table 3.—Percent distribution of respondents by drinking level according to race/ethnicity and sociodemographic characteristics: males only

Characteristic	White (non-Hispanic)				Black (non-Hispanic)				Hispanic			
	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker
Age												
18-34	17	30	35	18	42	27	22	9	30	25	27	18
35-54	24	31	28	17	35	21	26	18	32	25	30	13
55+	39	27	20	15	58	17	13	13	45	25	20	—
Marital status												
Married	27	32	27	15	44	21	22	14	33	23	29	15
Separated/divorced	18	20	34	28	28	31	25	17	—	—	—	—
Never married	21	26	34	19	48	24	19	8	35	27	21	17
Education												
Less than high school	41	26	20	14	54	16	15	16	43	20	24	13
High school graduate	23	31	29	17	43	24	23	11	29	24	28	19
More than high school	18	30	34	18	26	34	30	9	22	34	29	15
1982 family income												
Less than $10,000	36	23	25	17	51	21	16	12	39	25	19	—
$10,000-$24,999	29	29	28	15	41	23	25	11	32	27	22	19
$25,000 and over	18	32	31	18	31	30	27	13	22	24	34	20
Employment status												
Employed	22	31	31	17	36	26	25	13	30	26	28	16
Unemployed	21	26	30	23	36	23	23	18	38	—	26	—
Not in labor force	39	25	21	15	62	17	13	9	42	26	21	—
Census region												
Northeast	20	29	32	19	46	24	19	12	44	23	23	—
North Central	23	32	30	15	43	25	20	12	—	—	—	—
South	34	26	25	15	45	21	22	12	34	25	25	17
West	22	30	29	19	30	31	26	—	31	25	28	16

Note: Weighted percentages. Row percentages may not add to 100 because of rounding.

— = Fewer than 15 cases.

Table 4.—Percent distribution of respondents by drinking level according to race/ethnicity and sociodemographic characteristics: females only

Characteristic	White (non-Hispanic)				Black (non-Hispanic)				Hispanic			
	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker
Age												
18-34	34	39	22	5	58	28	11	3	63	25	11	—
35-54	43	34	17	6	64	24	10	18	66	23	9	13
55+	62	23	11	3	90	6	—	13	77	14	—	—
Marital status												
Married	46	34	16	4	68	23	8	14	67	22	8	—
Separated/divorced	35	35	22	8	60	22	13	17	59	26	14	—
Never married	34	33	25	8	63	24	10	8	66	20	12	—
Education												
Less than high school	67	21	9	3	76	15	8	—	79	13	5	—
High school graduate	45	34	16	4	62	26	9	4	63	26	11	—
More than high school	31	39	23	7	61	26	10	—	42	37	16	—
1982 family income												
Less than $10,000	59	23	13	4	74	15	9	—	73	19	—	—
$10,000-$24,999	48	31	17	4	66	23	8	—	69	20	9	—
$25,000 and over	35	39	21	6	55	31	11	—	49	33	15	—
Employment status												
Employed	36	38	21	6	60	28	9	3	58	28	11	—
Unemployed	40	37	17	6	51	32	—	—	62	—	—	—
Not in labor force	57	26	13	4	79	12	7	—	74	16	8	—
Census region												
Northeast	39	37	19	5	65	23	9	—	67	26	—	—
North Central	44	33	19	4	65	21	11	—	57	31	—	—
South	58	27	12	4	71	21	6	—	69	19	8	—
West	38	35	21	7	55	23	17	—	66	21	10	—

Note: Weighted percentages. Row percentages may not add to 100 because of rounding

— = fewer than 15 cases.

Table 5.—Percent distribution of respondents by self-reported health status according to racial/ethnic group, drinking level, and sex

Health status	White (non-Hispanic)					Black (non-Hispanic)					Hispanic				
	Total	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Total	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Total	Abstainer	Light drinker	Moderate drinker	Heavier drinker
Males															
Excellent/very good	67	55	69	74	69	52	47	57	60	46	61	55	64	66	59
Good	22	24	21	20	22	28	30	25	27	30	28	31	24	26	32
Fair/poor	11	20	10	6	9	20	24	18	13	24	11	14	12	9	—
Females															
Excellent/very good	61	51	68	72	69	44	41	48	57	50	49	42	61	63	73
Good	26	30	24	21	23	30	29	37	26	—	31	34	26	25	—
Fair/poor	13	20	8	7	8	26	31	15	17	—	21	24	13	—	—

Note: Weighted percentages. Column percentages may not add to 100 because of rounding.

— = fewer than 15 cases.

for the former drinking status of some of the abstainers. In previous research using these 1983 data, Malin et al. (1985) found that the U-shaped relationship between the number of adverse health conditions and current drinking status persisted even when the effects of sex, age, and former drinking status were controlled.

Table 6 presents the percentage of men and women in each racial and ethnic group by drinking level who reported one or more lifetime problems associated with alcohol, including family or marital problems, job or work problems, injuries, health problems, and motor vehicle accidents or violations. For the U.S. population as a whole, motor vehicle accidents or violations were more prevalent for men than for women; family or marital problems, by contrast, were more prevalent for women. The percentages for the abstainers in table 6 are for problems reported by former drinkers (i.e., those respondents who reported that they drank in the past but had not had a drink within the preceding year). For each racial and ethnic group, heavier drinkers always reported more problems associated with drinking than any other drinking category. Thus, there appears to be a linear relationship between the levels of drinking and self-reported problems associated with alcohol. Compared with the lifetime prevalence rates presented here, 12-month prevalence rates on problems associated with alcohol were quite low.

In addition to the health conditions included in the core NHIS questionnaire, respondents sampled for the alcohol questionnaire were asked to indicate whether they had ever had any of 25 selected health conditions. Examples of these conditions include high blood pressure, shortness of breath, insomnia or sleeplessness, arthritis or rheumatism, heart conditions, ulcers, stroke, diabetes, delirium tremens, and alcoholism. Table 7 presents the percentage of respondents who reported ever having had one or more of these health conditions by racial and ethnic group and by sex. Similar to the previous findings on self-reported health status, moderate drinkers were less likely to have an adverse health condition than respondents in any of the other drinking categories. Thus, the U-shaped relationship was present for reported health conditions for both men and women in each of the racial and ethnic groups. As with the findings regarding self-reported health status, the implication is that moderate drinking may have some beneficial health consequences. Further research regarding these results is currently under way at NIAAA's Alcohol Epidemiologic Data System.

Conclusions

This paper has presented recent alcohol data from the 1983 National Health Interview Survey. In line with the focus of the minority conference, drinking levels have been examined on a variety of variables according to selected racial and ethnic groupings. Because of limited sample sizes, the analytic groups have been restricted to white non-Hispanics, black non-Hispanics, and Hispanics. The research results indicate that levels of drinking vary among whites, blacks, and Hispanics in terms of abstinence (as defined by the survey), but among drinkers of either sex, the groups do not differ in light, moderate, and heavier drinking.

One observation from this study–an observation that is important to the field of alcohol research–is that among the racial and ethnic groups examined, variables such as age, education, family income, marital status, and geographic region tend to relate to the drinking levels in somewhat similar ways; furthermore, these patterns generally hold for both sexes. This finding suggests that differences in drinking levels, which often have been attributed to racial or ethnic membership, may reflect socioeconomic characteristics more than race or ethnicity. Further research is needed to find the most relevant determinants of drinking patterns for all subgroups in the population.

Finally, some rather provocative results were found in this study regarding the associations of drinking levels with self-reported health status and health conditions. Moderate drinkers in each of the racial and ethnic groups reported a better health status and had fewer lifetime adverse health conditions than either abstainers or heavier drinkers. This U-shaped relationship between drinking and health is found frequently in the alcohol literature. If the relationship persists when former drinking, age, sex, and other variables are controlled, it suggests that moderate drinking may have some potential health benefits. The 1983 NHIS provides a wealth of data on drinking and health variables on which these and other important alcohol research issues can be addressed.

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Table 6.—Percentage of respondents reporting one or more lifetime problems associated with drinking by racial/ethnic group, drinking level, and sex

	White (non-Hispanic)				Black (non-Hispanic)				Hispanic			
Sex	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker
Male	9	11	16	28	7	10	20	37	7	10	17	30
Female	2	4	8	14	—	—	—	—	—	—	—	—

Note: Weighted percentages. The reciprocal of each cell percentage is the weighted percentage of respondents without one or more self-reported drinking problems. Abstainers with reported lifetime problems are "former drinkers" who had not had a drink for a year or more prior to the interview.

—=fewer than 15 cases.

Table 7.—Percentage of respondents reporting 1 or more of 25 health conditions by racial/ethnic group, drinking level, and sex

Sex	White (non-Hispanic)				Black (non-Hispanic)				Hispanic			
	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker	Abstainer	Light drinker	Moderate drinker	Heavier drinker
Male	60	51	47	57	51	49	42	57	41	39	37	41
Female	67	55	51	65	62	50	50	59	51	51	47	74

Note: Weighted percentages. The reciprocal of each cell percentage is the weighted percentage of respondents without 1 or more self-reported health conditions from a list of 25 conditions, i.e., no reported health conditions.

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NHANES I Epidemiologic Followup Study: Methodological Issues and Preliminary Findings

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ABSTRACT

Data from the National Health and Nutrition Examination Survey I (NHANES I) and the subsequent NHANES I Epidemiologic Followup Study were used to explore alcohol consumption patterns for black men and women and white men and women. Abstention rates were higher among blacks than whites and higher among females than males. Consumption levels, among those who drank, did not differ by race. Survival analysis was applied to mortality and morbidity data from the followup survey to assess the differential risks of drinking patterns at the time of the baseline survey. After age 58, heavy drinkers had decreased rates of survival. Abstinence from alcohol and heavy drinking both tended to be associated with increased onset of disease, and moderate drinking appeared to be protective against heart attack, heart disease, kidney disease, and stroke.

Introduction

In the United States, as in other developed nations, the longstanding preeminence of communicable disease has given way to chronic disease as the scourge of mankind. Despite similar environmental exposure, the mortality experience today of blacks and whites differs significantly. Effective health policy is fostered in the revelation of the sounder among contrasting lifestyle choices and in the exposure of true biologic vulnerabilities. In this paper, patterns of alcohol consumption and death and disease are examined among black men and women and white men and women by age.

The National Health and Nutrition Examination Survey I (NHANES I) and the subsequent Epidemiologic Followup Study are well suited to address these kinds of issues. The purposes of this paper are to provide an overview of the NHANES I followup and baseline survey program, to outline some of the methodological considerations in analyzing the data, and to present some preliminary findings.

Background

A subsample of respondents to the NHANES I baseline study, conducted in 1971-1974, was recontacted in 1982-1984 for the NHANES I Epidemiologic Followup Study. Undertaken by the National Center for Health Statistics (NCHS), with additional funding and technical support from several of the Institutes of the National Institutes of Health and the Alcohol, Drug Abuse, and Mental Health Administration, the followup study was designed to investigate relationships among physiological, nutritional, social, psychological, and demographic factors and subsequent morbidity and mortality from specific diseases.

The NHANES I baseline study collected a broad spectrum of health and nutrition data from civilian noninstitutionalized persons residing in the 48 contiguous States (excluding lands reserved for American Indians). In addition to other components, the study included a medical history interview conducted in the participant's home. Questions on alcohol consumption were part of this interview. The sample design was a multistage, stratified probability sample of clusters of persons in land-based segments. The sample areas consisted of 65 primary sampling units (PSUs), augmented by 35 more PSUs to enlarge the detailed sample. The alcohol baseline data are from the national sample, consisting of the first 65 PSUs. Women in the childbearing years (ages 25-45), young children, and elderly persons (aged 65 and older) were oversampled in NHANES I, as were poverty areas. Household interviews were completed for 99 percent of the adults selected for the NHANES I sample, and approximately 70 percent were examined. (The NCHS has calculated sample weights to compensate for the nonresponse and oversampling.) The baseline sample consisted of 82 percent whites and 17 percent blacks; the "other" racial group was too small to disaggregate.

The alcohol questions on NHANES I began with a screener question: "During the past year have you had at least one drink of beer, wine, or liquor?" This was followed by: "How often do you drink?" "Which do you most frequently drink–beer, wine, or liquor?" and "When you drink (beer, wine, liquor), how much do you usually drink over 24 hours?"

The NHANES I Followup Study, anticipated to be the first of several, focused on 14,407 adults aged 25 to 74 at baseline who were recontacted after an interval of 8 to 13 years. Those original respondents who were alive and well were reinterviewed in their homes. Proxy interviews were conducted for the incapacitated and the dead, and death records were obtained for those who had died. The followup questionnaire, administered to 12,224 of the original respondents or their proxies, included a medical history of heart disease, hypertension, stroke, diabetes, cancer, and other conditions. Data on nutrition, body weight, limitation of functioning, psychological variables, smoking, and use of alcohol were also collected.

Some of the analyses in this paper use the alcohol items from the baseline survey as risk factors for subsequent mortality and morbidity. The mortality outcomes are based on data from death certificates. The morbidity results are based on the report of the respondent at followup and have not yet had the benefit of further verification from hospital records.

Tracing of the baseline subjects was 93 percent successful. Younger blacks were the most difficult to trace, and males were more difficult to trace than females. Young white females were the next most difficult group to locate. Sixteen percent of the total sample were deceased at followup. Demographically, decedents represented 31 percent of black males, 23 percent of white males, 15 percent of black females, and 10 percent of white females.

The followup alcohol questions were of four types. The first battery began with two screener questions: "Have you had at least 12 drinks of any kind of alcoholic beverage in any one year?" and "Have you had at least one drink of beer, wine, or liquor during the past year?" The rest of the first battery covered frequency ("How often do you drink?") and quantity ("How many drinks do you usually have? How many of the past 12 months did you have at least one drink? How many days did you have at least 9 drinks?–at least 5 drinks?"). The second set of questions dealt with self-perceptions of consumption levels: "Do you now consider yourself a light, moderate, or heavy drinker?" The third set was designed to chart a history of alcohol consumption. Questions were asked about consumption at 10-year intervals starting with 25 years of age. The final set of alcohol questions in the followup study were specific to beverage types and were asked in the context of a very long nutritional section: "On the average, how many (cans or bottles of beer) do you drink per day? week? month? or year?" Questions about the other beverage types were asked in the same way.

General Methods

Three types of analyses are reported in this paper. First, cross-tabulations and other descriptive statistics were used to analyze patterns of alcohol consumption by sex, race, and age. Second, time-based survival analysis was used to assess levels of prior alcohol use as a risk factor for mortality and the onset of various diseases. Finally, the baseline drinking habits of persons who were well and those who had died by the time of followup were compared.

In generating data from the responses to the alcohol questions, the average number of drinks per day was computed from the responses to quantity and frequency questions and then was converted to absolute alcohol using the rule that each drink, regardless of beverage type, contains about a half ounce of absolute alcohol.

For analyses based on the percent distributions of drinkers by type, categories were defined as follows: (1) Abstainers: less than 0.01 ounces of absolute alcohol per day (this category incorporates those whose answers to screening questions relegated them to nondrinking status); (2) light drinkers: 0.01-0.21 ounces per day, or up to three drinks per week; (3) moderate drinkers: 0.22-0.99 ounces per day, or up to 13 drinks per week; and (4) heavy drinkers: 1 ounce of absolute alcohol per day or more, which amounts to 14 or more drinks per week.

Drinking categories were defined in the same way for both NHANES I and followup study data. These definitions are consistent with those used for analyses of the preliminary results of the 1983 National Health Interview Survey (NHIS) and the Hispanic HANES (as presented in this volume) and with other analyses in the literature for other survey data, such as those reported by Clark and Midanik (1982). It should be remembered that the category of "heavy drinker" does not necessarily indicate a serious drinking problem and also that the "abstainer" category includes individuals who drink.

Sampling weights were used to compensate for oversampling of females, older people, and persons with low incomes. These weights apply to the first 65 data collection sites, which constitute the original sample from NHANES I. Limiting the study to data from these sites eliminated about 30 percent of the data. All percentages and means shown are based on weighted data, and numbers of cases presented are raw unweighted numbers.

Two conventions apply to the analyses that follow: (1) Abstainers were included in all distributions of individuals by drinking category, but (2) abstainers were excluded from calculations of mean daily consumption. (This is also consistent with analyses of the 1983 HIS data as presented in this volume.)

Basic Findings on Consumption at Followup

The first analysis dealt with the distribution of respondents according to drinking type and the mean consumption for those who reported that they drink. As shown in table 1, 40 percent were abstainers, 32 percent were light drinkers, 17 percent were moderate drinkers, and 12 percent were heavy drinkers. The proportion of abstainers is high because the sample is relatively old; ages ranged from 33 to 87 years at followup. The mean alcohol consumption among males was more than twice that of females. Similarly, the percentage of abstainers was far higher among women than men. According to age, there was a systematic decrease in mean consumption after the 45-54 age category. Abstinence rates showed a progressive increase with age, beginning with 29 percent of the 35- to 44-year-olds and doubling by the age of 75.

Some of the main effects discussed previously break down into interactions when the data are examined in detail (figure 1). For example, among males, the greatest percentage of heavy drinkers is found among persons aged 45-54. The increase in the abstinence rate with age shows up in both sexes (figure 2). While the plurality of younger women were light drinkers (42 percent of women aged 35-44), only 19 percent of women aged 75 and older were light drinkers.

More blacks were abstainers than whites; but among drinkers, there was little difference between the races in the amount of alcohol consumed (table 1). According to combinations of race, sex, and age, the abstinence rate among black males was higher in every age category than among white males (figure 3); this was also true for black females and white females. Increases in the percentage abstaining by age were reasonably parallel across race/sex groups.

When considered by age for the race/sex groups, some distinct differences emerged in the mean consumption of those who drank (figure 4). For black males, the highest consumption was found among persons 34-44 years old. For white males, consumption peaked later, in the 45-54 age range. Black males under age 55 drank more than white males under 55, but between the ages of 55 and 74, this pattern was reversed. Among women, there was less change in consumption with age than among men. However, an interesting racial difference was found: There was a slight increase in consumption among white women as they got older, while black women drank less as they got older.

Table 1.—Mean daily alcohol consumption and percent distribution of respondents by drinking categories according to sex, race, and age at followup

		Sex		Race		Age group				
	Overall	Male	Female	Black	White	34-44	45-54	55-64	65-74	75+
Mean daily consumption for drinkers	0.54	0.73	0.31	0.53	0.54	0.51	0.62	0.55	0.48	0.39
				PERCENT DISTRIBUTION						
Abstainer	40.0	28.3	49.9	55.5	38.5	29.3	33.5	39.9	50.3	60.9
Light drinker	31.5	30.6	32.2	23.3	32.2	39.9	32.0	28.9	28.2	23.2
Moderate drinker	16.7	21.8	12.4	12.5	17.0	19.7	20.0	17.6	12.4	7.9
Heavy drinker	11.8	19.3	5.5	8.7	12.1	11.1	14.4	13.5	9.0	8.0

Note: Percentages may not add to 100 because of rounding.

Figure 1. Percent in drinking categories by age at followup: males only

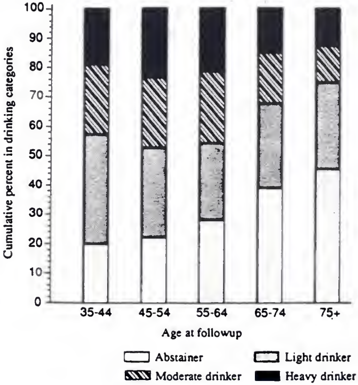


Figure 2. Percent in drinking categories by age at followup: females only

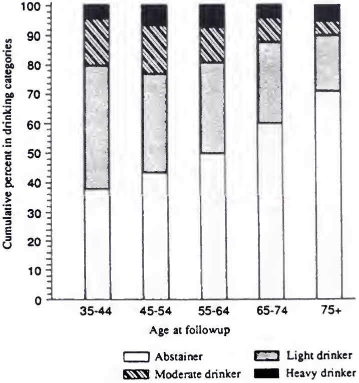
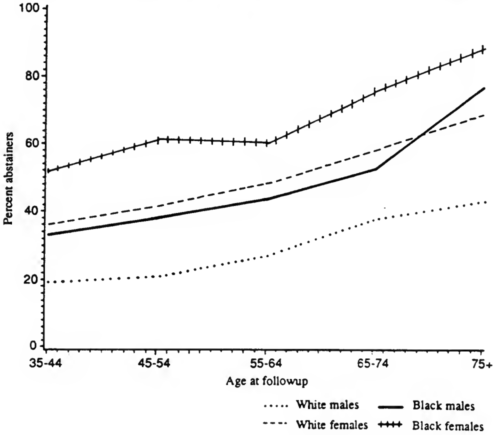


Figure 3. Percent abstainers by age at followup according to race and sex



To summarize the findings, females drank less than males and had a larger proportion of abstainers; more blacks abstained than whites, but among those who drank, there was no racial difference in the amount they drank. In general, abstinence increased with age, but the peak amount of drinking occurred between the ages of 45 and 54. Among males, the age of peak drinking was lower for blacks than for whites.

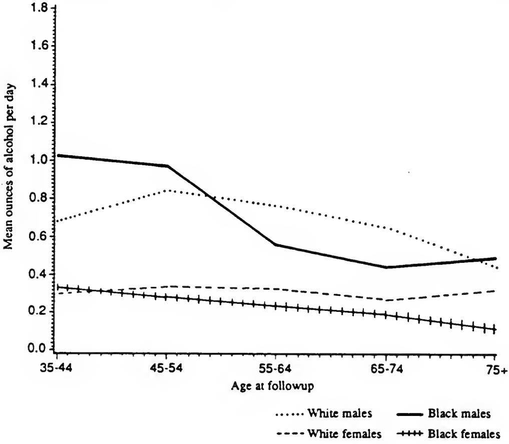
Survival Analysis–Methods and Preliminary Findings

Data from NHANES I and the NHANES I Epidemiologic Followup Study were linked to study the association of drinking at the time of the initial interview with subsequent onset of disease and mortality. The time that elapsed between the initial interview and the followup interview ranged from 8 to 13 years. To control for differential opportunities for mortality or disease events to occur, survival analysis was applied (Lakagos and Wah 1985). The basic tool of survival analysis is the survival function, a graph that shows the proportion of persons still alive in each time interval. Although the survival analysis procedure is generally described in terms of mortality, the procedure can also be applied to disease onset.

Generating survival functions with weighted data required the development of a computer program. The algorithm that was applied followed a statistical model developed by Campbell and Foldes (1984). It should be noted that there are, as yet, no models for weighted survival analyses that provide variance estimates or support multiple regression analysis. In the absence of a conclusive method for assessing the contribution of risk factors, survival functions must be compared visually to identify differential risks.

For the analyses that follow, the time variable is age rather than interval from NHANES I to followup. The procedure produced synthetic lifespan estimates conditional on survival to age 25. Data for individuals

Figure 4. Mean alcohol consumption by age at followup according to race and sex (excludes abstainers)



were considered in the analysis starting with their age at NHANES I and ending with their age at followup or death, whichever came first. Consequently, the numbers of cases vary across age. Survival curves were generated according to race, sex, combinations of race and sex, drinking classification, and drinking classification for each sex. Drinking classifications for these analyses were taken from the NHANES I data.

Overall, whites had higher rates of survival than blacks (figure 5) and females had higher rates of survival than males (figure 6). Considered in combination, the effects of race and sex appeared to be additive (figure 7). Survival according to drinking pattern revealed that after the age of about 58, heavier drinkers had markedly lower rates of survival (figure 8). Abstainers fared the best from ages 50 through 70, after which moderate drinkers were the most successful. Approximately the same relationships were found when the survival curves were produced for males alone (figure 9). Among women, moderate drinking appeared protective after the age of about 73, while abstinence from alcohol was associated with lower survival rates (figure 10).

These findings for alcohol and total mortality are on the whole consistent with those of other longitudinal surveys. In a 10-year study of mortality among members of the Kaiser Foundation Health Plan, heavy drinking was the least healthy pattern, followed by abstinence (Klatsky et al. 1981). Likewise, data from the Framingham Study showed that, for males, abstainers had a higher mortality than drinkers, and light drinkers had the lowest mortality (Gordon and Kannel 1984).

Among the 1,613 individuals who died between NHANES I and the followup study, cirrhosis was reported as the underlying cause of death in 12 cases. The proportionate mortality rate (PMR) for cirrhosis in the sample was 7.79 per 1,000 deaths. This rate was notably lower than the PMR for total deaths from cirrhosis in the United States, which was 15.38 per

Figure 5. Survival by age based on NHANES I and followup according to race (weighted data)

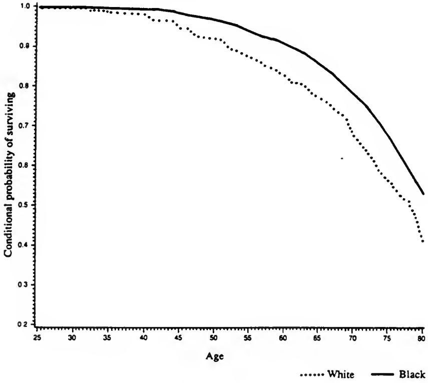


Figure 6. Survival by age based on NHANES I and followup according to sex (weighted data)

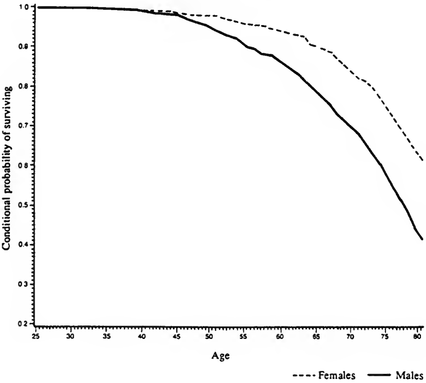


Figure 7. Survival by age based on NHANES I and followup according to race and sex (weighted data)

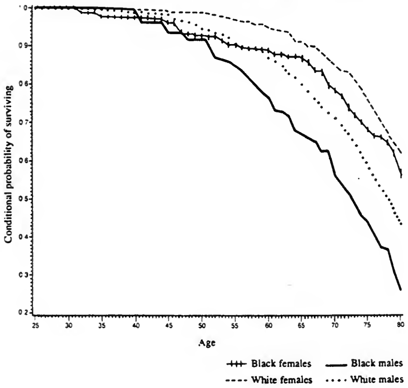


Figure 8. Survival by age based on NHANES I and followup according to drinking pattern (weighted data)

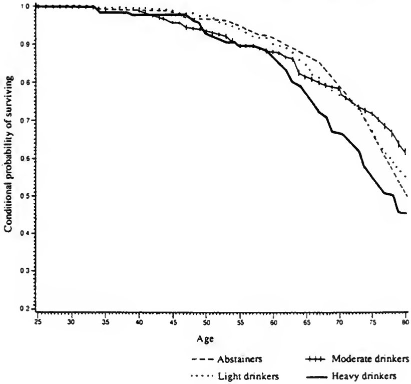


Figure 9. Survival by age based on NHANES I and followup according to drinking pattern: males only (weighted data)

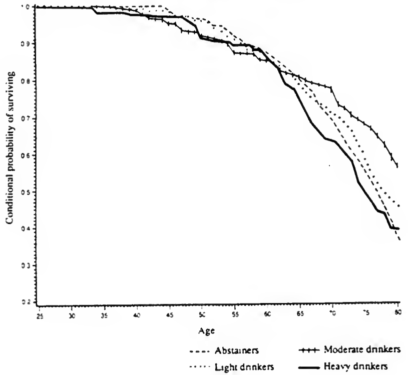
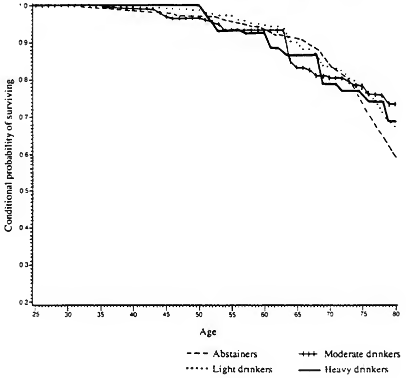


Figure 10. Survival by age based on NHANES I and followup according to drinking pattern: females only (weighted data)



1,000 in 1979 (NCHS 1979). No other deaths were attributed to recognized alcohol-related causes.

"Survival" Analysis of Disease Onset

A number of survival curves were generated to describe patterns of the onset of several diseases according to sex, race, and drinking patterns at NHANES I. The findings that resulted from these analyses are summarized below.

Blacks showed a slightly greater risk of cirrhosis, with a greater concentration of cirrhosis among males. Heavy drinkers were much more at risk than other groups; this increased risk started around the age of 35 and was seen among both males and females.

For heart attacks, blacks had a slightly greater risk than whites, and males were at greater risk than females. The curves for males and females started to diverge at around age 45. Black males had a greater prevalence of heart attack than white males. Comparing drinking categories, the greatest risk was among heavy drinkers. Moderate drinkers, in contrast, had diminished risk of heart attack. For males, the greatest risk was observed among abstainers and the least among moderate drinkers. This difference appeared around the age of 59. For women, heart attacks were most common among heavy drinkers and least common among moderate drinkers. The critical age among women for increased risk appeared to be 52 years. Similar results have been found in other studies; moderate alcohol use has been found to exert a protective effect on ischemic and hypertensive heart disease in the aged (Rodstein 1980).

Blacks were more prone to develop heart disease than whites, starting around the age of 35. Overall, women had a lesser risk of heart disease than men, a difference which appeared around the age of 45. According to race and sex in combination, the greatest risk was among black females and the least among white females. Moderate drinkers appeared to have a diminished risk of heart disease and heavy drinkers an increased risk. This pattern held for males, with curves starting to diverge around the age of 47. For females, however, abstainers were definitely at greater risk than others, starting around the age of 46. Consistent with the overall pattern and the pattern for males, female moderate drinkers appeared to have less risk of heart disease.

Stroke was less of a risk among blacks between the ages of 55 and 75 than among whites in the same age range. A comparison by sex showed males having the greater risk after the age of 60. Beginning around the age of 52, the risk of stroke was greatest among white males and lowest among black males. Moderate drinking appeared to be protective against stroke, with the clearest benefits being observed among males.

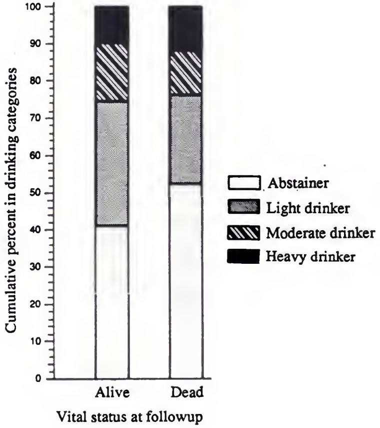
Ulcers showed no race or sex differences. However, the effects of drinking patterns differed for males and females. Among males, abstainers had a much greater risk of ulcers and light drinkers a reduced risk. Among females, moderate drinking appeared to confer the greatest risk, beginning around the age of 60.

Kidney disease was a greater risk for males than females, regardless of race. The association between kidney disease and drinking began around age 53 for men and age 30 for women, when abstainers were at greatest risk. Moderate and heavy drinking appeared to be protective against kidney disease in both sexes.

Comparison of NHANES I Drinking Pattern According to Vital Status at Followup

Drinking pattern differentials in survival were also investigated by examining drinking category distributions and mean consumption at NHANES I by the subject's vital status at followup (figure 11). Forty-one percent of those who were living had been abstainers, compared with 52 percent of those who were dead. Light drinking had been more common among those who were alive at the time of the followup than among those who had died. Analysis of daily consumption showed that those who had died by followup averaged 0.74 ounces at baseline, while those who survived had averaged 0.48 ounces. This relationship held for both males and females. Considered across age groups (figure 12), the greatest difference was for males between the ages of 55 and 64 (NHANES I ages); dead males in this age group had averaged 1.24 ounces of ethanol daily, while males still alive at followup had averaged 0.54 ounces per day. For most age groups, males who died had drunk more than those who were alive at followup. Among females this tendency was observed for persons between the ages of 35 and 54.

Figure 11. Drinking category distributions at NHANES I for followup subjects by vital status



Summary

The NHANES I and the NHANES I Epidemiologic Followup Study have been used to explore the patterns of alcohol consumption for black and white men and women. Abstinence was found to be higher among females than among males and higher among blacks than among whites. Among those who drank, consumption did not differ by race. However, consumption declined after age 54.

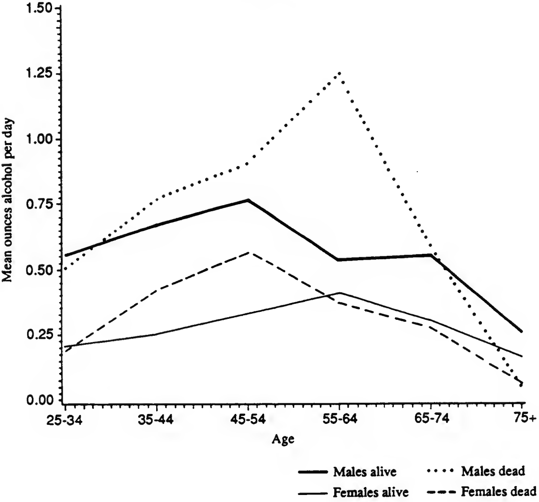
Survival analyses were performed by using total mortality by race, sex, race and sex, drinking pattern, and drinking pattern by sex. Whites had higher rates of survival than blacks, and females had higher rates of survival than males.

Drinking patterns at baseline were analyzed as risk factors for both mortality and disease onset. After age 58 heavy drinkers had decreased rates of survival. Both abstinence from alcohol and heavy drinking tended to be associated with increased onset of disease, while moderate drinking appeared to be protective for four of six medical conditions studied: heart attacks, heart disease, stroke, and kidney disease.

The relationship of drinking patterns to longevity found in survival analyses was verified by comparing drinking patterns reported in NHANES I for individuals divided according to their vital status at followup. Abstinence and heavy drinking, which the survival analyses had suggested were unhealthy, were disproportionately high among persons who had died by followup.

The analyses reported here are preliminary and, although provocative, are only a beginning toward analyzing the very rich NHANES I epidemiologic longitudinal surveys.

Figure 12. Mean daily consumption by age at NHANES I according to vital status at followup



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Self-Reported Alcohol Use and Abuse Among Mexican Americans: Preliminary Findings From the Hispanic Health and Nutrition Examination Survey Adult Sample Person Supplement

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ABSTRACT

Data from the National Institute on Alcohol Abuse and Alcoholism Adult Sample Person Supplement (ASPS) of the National Center for Health Statistics' 1983 Hispanic Health and Nutrition Examination Survey are analyzed to assess differences among Mexican Americans. These differences are analyzed in terms of (1) quantity and frequency of alcohol use, (2) types of beverages consumed, (3) perceived versus objective drinking behavior, and (4) selected sociodemographic characteristics (age, sex, marital status, language, income, and education). Analyses reveal that Mexican Americans (N = 4,912) differ significantly by the quantity, frequency, and variability of alcohol consumption and by the types of beverages consumed. Overall, 49 percent of Mexican American respondents are abstainers, of which 4 percent are former drinkers. Fifty-one percent are drinkers, of which 45 percent are regular or current drinkers and 6 percent are occasional drinkers. Beer is the most frequently consumed alcoholic beverage. Mexican American respondents perceive their drinking as considerably less than what the objectively constructed standards reveal. Further analyses indicate that sociodemographic characteristics are particularly meaningful in understanding overall and differential drinking behavior. Abstainers tend to be older, female, single or widowed, and Spanish-speaking, with lower income and education, while drinkers tend to have the opposite characteristics. Although these findings are preliminary, they point to a need for more rigorous quantitative research in this area.

Introduction

Several national surveys have been conducted during the past decade to characterize the drinking patterns of the U.S. population. These surveys, conducted and/or sponsored by the National Institute on Alcohol Abuse and Alcoholism, are evidence of the increased Federal role in achieving a better understanding of the devastating impact of alcohol use and abuse in our lives and in providing improved treatment as well as preventing alcohol dependence before it develops. Results of these surveys, mostly of self-reported drinking behavior, are fairly similar. Approximately one-third of the adults describe themselves as abstainers, one-third as light drinkers, and the remaining one-third as moderate or heavier drinkers (U.S. Department of Health and Human Services [DHHS] 1983).

These national surveys have uncovered much pertinent information on the patterns and level of alcohol use and abuse among the general population; nevertheless, problems associated with alcohol use and abuse still affect a sizable proportion of the U.S. population. Several startling statistics reinforce the fact that alcohol is undoubtedly the most widely used and abused drug in the United States. In 1981, the equivalent of 2.77 gallons of absolute (pure) alcohol was sold per person over age 14. This translates into 591 12-ounce cans of beer, 115 bottles (fifths) of table wine, or 35 fifths of 80 proof whiskey, gin, or vodka (DHHS 1983). The data from these surveys further show that only one-tenth of the drinking population consumes half the alcoholic beverages sold.

Over the last few years, increased attention has been directed toward understanding the patterns and levels of alcohol use and abuse among special and minority populations in this country. A number of national surveys have recently been completed that focus on the differential drinking patterns of these groups. Such efforts were prompted by several credible but smaller and more localized surveys that found disporportionately high levels of alcohol consumption and a higher prevalence and incidence of alcohol-related problems among these populations (Kunitz et al. 1971; Harper 1976, 1978; Alcocer 1977).

The descriptive studies from both national and localized surveys enrich our knowledge of alcohol use and alcohol-related problems among minority populations. Although more information is needed, some efforts toward meeting these needs are being initiated. Clearly, minority groups are culturally different, and within these groups subcultures exist. Such groups differentially perceive drinking opportunities, limitations, and functions within culturally defined environments (Schaefer 1982).

It has been reported that drinking behavior is related to the technology and norms of particular cultures, to the organizational, economic, and political characteristics of societies, and to the roles assumed by individuals within their social network (Institute of Medicine 1980). These factors determine the extent to which individuals are exposed to the risk of developing drinking problems. In essence, our further understanding of alcohol use and abuse and alcohol-related problems of minorities requires an assessment of the interaction of these factors.

This paper focuses on one particular minority subgroup–Mexican Americans. Although few studies have focused on Hispanic American subgroups, research on alcohol use patterns among Hispanic Americans in general provides useful information. For example, several studies note higher rates of heavy drinking among Hispanic males and higher rates of abstinence among females (Cahalan and Room 1974; Cahalan and Treiman 1976), perhaps suggesting that the Hispanic culture places positive sanctions on male drinking and negative sanctions on female drinking (Gilbert 1978). Others have found that Hispanic Americans, particularly males, tend to underreport their drinking behavior (Williamson 1976). A study of Mexican Americans in California further notes that less acculturated individuals self-report a lower number of heavy drinkers (de Rios and Feldman 1977). Still other research tends to show that while Hispanic women are more likely to be abstainers, their abstinence decreases with increasing acculturation (Alcocer 1977). Current drinkers among Hispanic women tend to be young or middle-aged and have more than the mean level of education (Cahalan et al. 1976).

While the literature points out several sociodemographic attributes which may influence drinking behavior and alcohol-related problems among Hispanic Americans (Maril and Zavaleta 1979), the evidence is particularly inconsistent in both time and space. Research findings suggest that Hispanic Americans tend to have higher alcohol use and alcohol-related problems than non-Hispanic whites, but the research offers little substantial information on the recent drinking practices among Hispanic American subgroups.

In this assessment of the drinking patterns of Mexican Americans, specific reference is made to the proportion of abstainers, current, occasional, and former drinkers and their consumption levels, beverage preferences, and self-described drinker categories (abstainer, light, moderate, and heavier). Also, alcohol consumption descriptors are assessed in relation to several sociodemographic variables: age, sex, income, education, language, and marital status. At this point, it is emphasized that none of our analyses are age-adjusted, and, thus, the findings and results of this research are provisional.

Data and Methodology

Because of the lack of specificity with regard to alcohol use among Hispanic Americans, and particularly among subgroups of this population, the Alcohol, Drug Abuse, and Mental Health Administration developed and sponsored the Adult Sample Person Supplement (ASPS) of the Hispanic Health and Nutrition Examination Survey (Hispanic HANES). This survey allows for a comprehensive assessment of alcohol use among subgroups of Hispanics (Cuban Americans, Puerto Ricans, and Mexican Americans) linked with a wide array of socioeconomic, health, biochemical, and nutritional data. NIAAA's section of ASPS provides the alcohol research community, for the first time, with a comprehensive data source on the drinking patterns of Hispanic Americans.

As part of Hispanic HANES, data were gathered for the supplement from July 1982 to December 1984. Data were collected on Mexican Americans, Cuban Americans, and Puerto Ricans from five southwestern States, from Dade County, Florida, and from the New York City area, respectively.

This paper is restricted to the data gathered on Mexican Americans. The ASPS was administered to 4,912 Mexican Americans between the ages of 12 and 74. Survey sampling was concentrated in Texas, California, Arizona, New Mexico, and Colorado, because about 83 percent of the 8.74 million Mexican Americans enumerated by the 1980 census live in these States. Adding appropriate weights to the sampled population presumes coverage of approximately 7 million Mexican Americans.

The survey instrument, composed of 75 questions, was designed to elicit information on self-reported beverage preferences, lifetime drinking patterns, and the quantity, frequency, and variability (QFV) of drinking, as well as reasons for not drinking. Additionally, the survey contains selected sociodemographic data on each respondent (age, sex, income, education, marital status, and language).

The survey instrument allows for categorizing the sample of respondents into four mutually exclusive groups (abstainers, current, occasional, and former drinkers) defined on the basis of their respective alcohol consumption and the time of the respondent's last alcoholic drink. Although each drinker group is analyzed in reference to drinking behavior, only current and occasional drinkers are specifically probed concerning their quantity, frequency, and variability of beer, wine, and spirits consumption over a 4-week reference period. This research uses the categorical breakdown of drinkers as described below:

Abstainers: Individuals who consumed fewer than 12 drinks of any kind of alcoholic beverage during their lifetime or who consumed fewer than 12 drinks of any kind of alcoholic beverage in any single year (N = 2,449 respondents).

Current Drinkers: Individuals who consumed an alcoholic beverage during the 28-day reference period immediately prior to their interview (N = 1,964).

Occasional Drinkers: Individuals whose last drink occurred before the immediate 4-week reference period and less than 1 year from the end of that reference period. The reference period for this category of drinker was the 4 weeks ending with the date of their last drink (N = 272).

Former Drinkers: Individuals whose last drink was 1 or more years prior to the end of the reference period (N = 210).

Former drinkers are considered part of the abstainer category, and only current and occasional drinkers were asked the detailed series of QFV questions about quantity, frequency, and variability. For each beverage type (beer, wine, and spirits), these drinkers were further evaluated in reference to their daily consumption. The mean daily ounces of absolute alcohol (MDAA) consumed for each beverage type and the total are calculated with the ethanol-per-ounce-of-beverage conversion factors of 0.04, 0.15, and 0.45 percent for beer, wine, and liquor, respectively. These MDAA values are used to construct an objective measure or scale of consumption (abstainers, light, moderate, and heavier drinkers).

The objective measure of alcohol consumption for each drinker type is as follows: Abstainers' daily consumption is less than 0.01 ounces of absolute alcohol; light drinkers' daily consumption is between 0.01

and 0.21 ounces of absolute alcohol, or about one drink every other day; moderate drinkers' daily consumption is between 0.22 and 0.99 ounces of absolute alcohol, or roughly one-half to fewer than two drinks per day; and heavier drinkers' daily consumption is in excess of 1.0 ounces of absolute alcohol, or the equivalent of approximately two drinks or more each day.

It is emphasized here that no tests of significance have been made on these data. Because the sample is drawn via a nonrandom design and because standard descriptive statistical packages provide variance estimates based on random samples, the true estimates of variance associated with these preliminary data analyses are considered to be as much as three times greater than those calculated with a simple random design. Future analyses of these data will be adjusted accordingly and will consider nonresponse bias. It is noted that all analytical groupings of respondents may not equal 100 percent because of rounding and nonresponse.

Drinking Behavior

Mexican Americans are initially classified according to drinkers and abstainers (figure 1). The category of drinkers comprises 51 percent of all Mexican Americans, with 45 percent current drinkers and 6 percent occasional drinkers. Forty-four percent of Mexican Americans are abstainers, and only 4 percent are former drinkers. Abstainers include individuals who meet the following criteria: (1)_Consumed fewer than 12 alcoholic drinks during their lifetime; (2)_consumed fewer than 12 drinks in any year; (3)_consumed their last drink more than 1 year from the 4-week reference period (these are classified as former drinkers (and are occasionally analyzed separately); and/or (4)_consumed less than 0.01 ounces of absolute alcohol on an average daily basis.

Abstainers and Former Drinkers: Reasons for Not Drinking

The leading reason abstainers (excluding former drinkers) offer for not drinking is that they neither care for nor like alcohol (table 1). More than one-half selected this choice. The next two leading reasons are "infrequent drinker" and "no need/not necessary." Only about 4 percent do not drink because of medical or health reasons, and smaller percentages do not drink for religious or moral reasons or because of an alcoholic family member.

Males and females are quite similar in their reasons for not drinking; both selected "don't care for/dislike it" as their leading reason for not drinking, but a greater proportion of females (63 percent) selected this reason than males (45 percent). The next two leading responses for males are "no need/not necessary" and "infrequent drinker." Females selected the same reasons for not drinking, but the importance is reversed.

Figure 1. Percent of Mexican Americans by drinker type

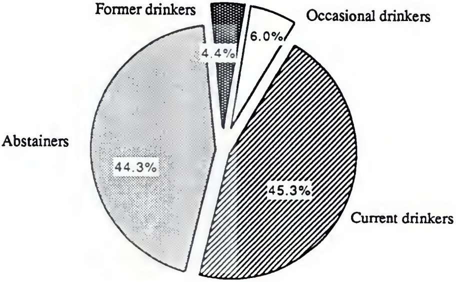


Table 1.—Reasons for not drinking among abstainers and former drinkers

Reasons for not drinking	Abstainers Total	Abstainers Male	Abstainers Female	Former drinkers
No need/not necessary	7.5	11.3	6.0	16.1
Don't care for/dislike it	58.1	45.0	63.4	12.4
Medical/health reasons	4.3	7.9	2.9	25.5
Religious/moral reasons	3.5	1.9	4.1	20.8
Brought up not to drink	2.4	1.4	2.8	n/a
Costs too much	.2	.5	.1	1.1
Alcoholic family member	1.1	.8	1.2	.8
Infrequent drinker	10.3	8.4	11.0	3.6
Alcoholic/problem drinker (self)	n/a	n/a	n/a	4.5
Other	11.9	21.3	8.0	15.0

Note: Totals may not equal 100 percent due to rounding.

n/a = not applicable or respondents were not presented this choice.

Former drinkers differ from abstainers in their reasons for not drinking. The largest proportion of former drinkers (about one-fourth) do not drink currently because of "medical/health reasons," followed by 21 percent who now abstain because of "religious/moral reasons," and 16 percent who find "no need" for alcohol and/or feel it is "not necessary" in their lives.

Alcohol Consumption

Of all Mexican Americans between the ages of 12 and 74 who have consumed alcoholic beverages (except for a small taste), about 80 percent started drinking between the ages of 14 and 21 (figure 2). Including those who started drinking before age 14, the cumulative data show that about one-half had started drinking before their 18th birthday, and by age 18, more than two-thirds had started drinking. Survey data further reveal that the largest percentage of Mexican Americans (16.5 percent) started drinking at the age of 18. Although as many as one-quarter did not start drinking until after they were 19 years of age, approximately 95 percent had started drinking by age 25. Clearly, any effort to prevent alcohol dependence must focus on the drinking practices of persons before age 25, but most preferably during the early and later teens.

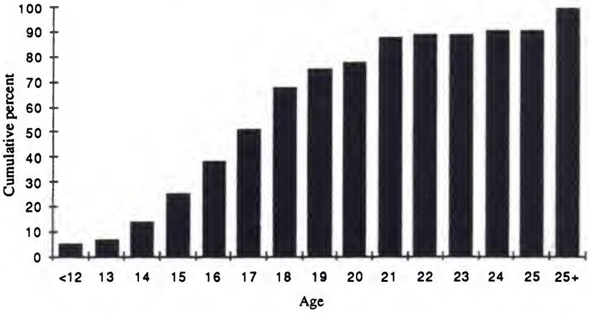
The Quantity, Frequency, and Variability of Beverage Consumption

The following QFV analyses focus on current drinkers only. The data show that Mexican American current drinkers differ widely in their drinking behaviors, particularly with reference to the QFV of alcoholic beverage consumed, as well as in their choice of alcoholic beverage. Beverage choices are not mutually exclusive. Based on respondents' self-reported drinking practices, beer is the most favored alcoholic beverage. During the reference period, 82 percent consumed beer, 42 percent consumed liquor, and 24 percent consumed wine (figure 3).

Beer

Although the largest percentage of Mexican American current drinkers identified themselves as beer drinkers, total beer consumption varies significantly among them. During the reference period, about one-third (32 percent) consumed 6 beers or fewer; about 15 percent drank between 7 and 12 beers; 18 percent consumed between 13 and 24 beers; and about 9 percent drank between 25 and 36 beers. This last-mentioned drinking behavior ranged from about 1 to 1 1/3 beers consumed daily. About one-quarter of those who consumed beer might be classified as heavy beer drinkers, having consumed in excess of 36 beers during the 28-day reference period. Roughly 10 percent drank between 37 and 60 beers, a consumption level that translates to more than 1 1/3 to 2 beers daily. At the upper end of this heavy beer consumption range are the drinkers (slightly less than 15 percent) who consumed from 2 to 28 beers daily. Interestingly, almost one of every seven Mexican American beer drinkers consumed more than 60 beers (in excess of two daily) during the 28-day reference period. Ninety-

Figure 2. Cumulative percent of Mexican Americans who started drinking alcohol at selected ages



one percent of all beers consumed contained 12 ounces.

The frequency of beer consumption among Mexican Americans who consumed beer during the reference period also differs. About 54 percent drank three or fewer beers on the days they drank beer, roughly 18 percent consumed between three and five beers, and 12 percent consumed a six-pack on the days they drank beer. Cumulatively, about 83 percent of those who consumed beer during the reference period drank a six-pack or less on these days. Of the remaining 17 percent, 12 percent consumed between 6 and 12 beers on the days they drank beer, and about 5 percent drank in excess of 12 beers.

The number of days on which beer drinkers consumed beer varies quite significantly. The median number of days is approximately 3; however, among the respondents who consumed beer on more than 3 days of the reference period (about one-half of the sample), there is a wide range. About 20 percent consumed beer 4 to 7 days; 11 percent, 8 to 14 days; and roughly 6 percent, 15 to 27 days. About 9 percent of beer drinkers consumed beer daily during the reference period.

Liquor

Liquor or spirits (such as whiskey, rum, gin, vodka, and tequila) was the second most frequently consumed alcoholic beverage among Mexican American current drinkers (chosen by 42 percent). Slightly more than one-half of these drinkers consumed fewer than 5 glasses of liquor during the reference period, about 20 percent drank between 5 and 9 glasses, and another 10 percent drank between 10 and 20 glasses. The remaining 13 percent consumed in excess of 20 glasses of liquor, slightly less than 1 glass per day. Most of these liquor drinks (76 percent) contained 1 ounce; 13 percent were 2-ounce drinks; and 3 percent were 3 ounces.

Twenty-five percent of liquor drinkers consumed only one drink on the days they drank liquor, another 25 percent had two drinks, about 37 percent consumed three to six drinks, and the remainder (about 10 percent) drank more than seven drinks.

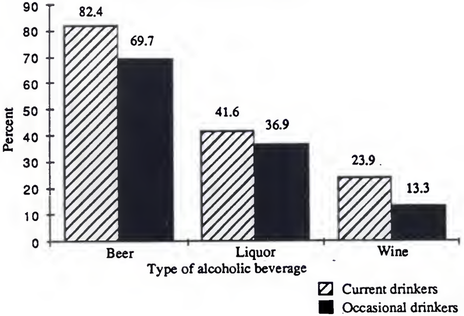
Liquor was consumed less frequently and on significantly fewer days than beer. As many as 58 percent consumed no liquor at all during the reference period. Of the remaining 42 percent, 24 percent drank liquor on only 1 day; 9 percent, 2 to 3 days; and about 5 percent, 4 to 7 days. Clearly, of those who consumed liquor, only a small percentage consumed liquor on more than 7 days of the reference period.

Wine

Wine was the least frequently consumed beverage. Slightly less than one-quarter of the drinkers (24 percent) consumed wine during the reference period. Cumulatively, about one-quarter of all wine drinkers

Figure 3. Type of alcoholic beverage consumed by Mexican American current and occasional drinkers

Fig. 3



consumed only one glass of wine, slightly more than one-half had between one and three glasses, and about three-fourths consumed seven or fewer glasses of wine. On the upper end of the drinking scale, about 14 percent consumed between 8 and 18 glasses, and about 10 percent had 20 or more glasses. About one-half of this latter group consumed an average of more than one glass of wine daily during the 28-day reference period. Approximately 91 percent of these drinks contained 8 ounces or less.

On the days that wine drinkers drank wine, about three-fourths consumed no more than two glasses (44 percent consumed one glass and 31 percent, two glasses). Cumulatively, 91 percent of wine drinkers consumed between one and four glasses of wine on the days that they drank wine. About 9 percent drank in excess of five glasses.

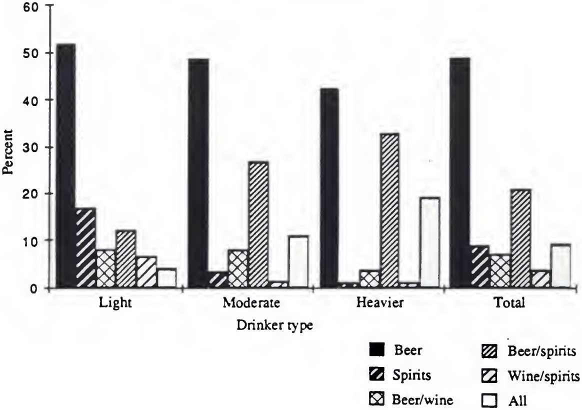
About 76 percent of current drinkers indicated that they had not had wine at all during the reference period. Of the 24 percent who consumed wine, 12.6 percent had wine only 1 day of the reference period, about 5 percent drank wine on 2 to 3 days, and about 2 percent drank wine on 4 days. Clearly, the overwhelming majority of wine drinkers consumed wine on 1 to 4 days of the reference period. Only about 4 percent of the drinkers consumed wine in excess of 4 days, but their proportions are scattered among the days so as to reduce any further meaningful interpretation.

Alcoholic Beverage Consumption by Drinker Type

Based on the mean daily ounces of absolute alcohol consumed by respondents, people can be further classified as abstainers, light drinkers, moderate drinkers, and heavier drinkers, as defined previously. With this objective classification, it is found that 47 percent of Mexican American current drinkers are light drinkers. Of this group, about one-half (52 percent) consumed only beer, 17 percent consumed only spirits, and 13 percent consumed beer and spirits (figure 4). Moderate drinkers comprise 35 percent of current drinkers and are predominantly "beer only" drinkers; approximately one-half (49 percent) are so classified. About one-fourth (26 percent) of moderate drinkers consumed beer and spirits only; 11 percent consumed all combinations of alcoholic beverages. Heavier drinkers make up 18 percent of current drinkers and have the lowest percentage (43 percent) of "beer only" drinkers. Almost one-third (31 percent) consumed beer and spirits only, and another 19 percent consumed all combinations of alcoholic beverages.

In general, these data show the largest percentage of each drinker type consumed "beer only," but the percentage of "beer only" drinkers is highest among light drinkers. Also, a higher percentage of light drinkers consumed "spirits only" and "wine and spirits only" than either moderate or heavier drinkers. Simi-

Figure 4. Most frequently consumed alcohol beverage combinations among Mexican American current drinkers



larly, higher percentages of light and moderate drinkers consumed "beer and wine" than did heavier drinkers, but higher percentages of heavier drinkers consumed "beer and spirits" and "all alcoholic beverage combinations" than either moderate or light drinkers.

Perceived Versus Objective Alcohol Consumption

The Adult Sample Person Supplement permits the comparison of one's self-perception of drinker type with one's self-reported alcohol consumption. Self-perception of drinker type is based on the respondents' classifying their drinking as light, moderate, heavy, or abstention. This self-classification is compared with the objective drinker type classification (as defined by the MDAA consumption scale) to discern any differences in respondents' perceptions of drinking versus an objective measure of their drinking.

Almost 64 percent of the current drinkers classified themselves as light drinkers, 31 percent as moderate, 3 percent as heavy, and only 2 percent as abstainers (figure 5). Clearly, from their perspective, almost two-thirds of current drinkers perceive themselves to be light drinkers. When respondents' self-reported alcohol consumption figures are translated and classified according to the objective MDAA standards, it is found that only 47 percent of current drinkers are actually light drinkers, 35 percent moderate drinkers, and 18 percent heavier drinkers. In essence, Mexican Americans tend to perceive their drinking as considerably less than the levels indicated by objectively constructed standards (figure 6).

Closer inspection of perceived and objectively classified drinker types shows the extent of this incongruity. Among those objectively classified as light drinkers, about 83 percent perceive themselves as light drinkers, but 14 percent perceive their drinking as moderate, and 3 percent perceive themselves as abstainers (figure 7). Among the objectively defined moderate drinkers, only 41 percent perceive themselves as such, but the majority (55 percent) perceive themselves as light drinkers. In the case of objectively

Figure 5. Self-reported drinker types among Mexican American current drinkers

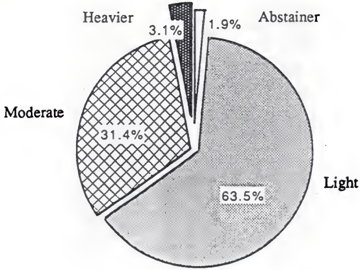
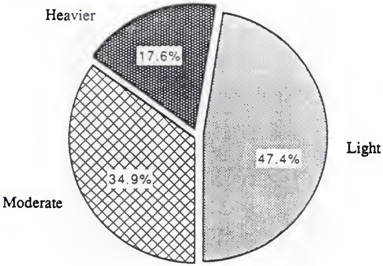


Figure 6. Objective drinker types among Mexican American current drinkers



Note: Based on mean daily ounces of absolute ethanol consumed:
Abstainer < .01, Light=.01-.21, Moderate=.22-.99, Heavier > 1.00.

Figure 7. Self-reported drinker classification compared with objective drinker classification among Mexican American current drinkers

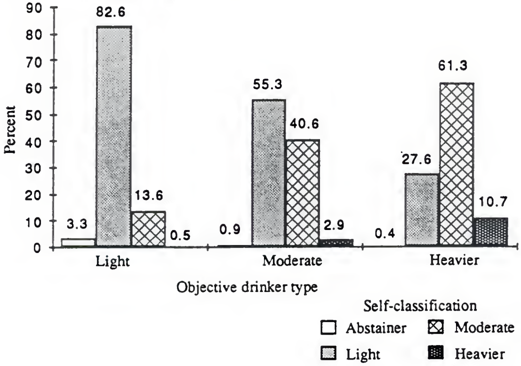
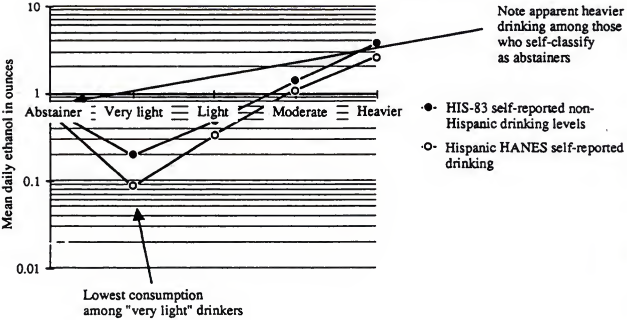


Figure 8. Mean daily ethanol consumption: non-Hispanics versus Mexican Americans



Note apparent heavier drinking among those who self-classify as abstainers

Lowest consumption among "very light" drinkers defined heavier drinkers, only 11 percent see themselves as such; yet 61 percent perceive their drinking as moderate, and, surprisingly, almost 28 percent perceive their drinking as light. In each of the drinker type categories, it is clear that Mexican Americans are more likely to see themselves as lighter drinkers irrespective of the amount of alcohol consumed.

A final analysis of MDAA intake entails a comparison of this index with that of non-Hispanics using the 1983 Health Interview Survey. Specifically, self-reported non-Hispanic drinking levels from the Health Interview Survey are compared with self-reported Mexican American drinking levels of the Hispanic HANES. The analysis shows clearly that although some difference is found among the MDAA consumed by these two groups (collected via different samples), a similar overall pattern exists (figure 8). Hispanic MDAA intake among all categories of drinkers is lower than that of non-Hispanics, particularly among very light drinkers. Non-Hispanics show heavier drinking among some individuals who classify themselves as abstainers. In sum, the similar pattern indicates a high degree of reliability associated with the data.

Sociodemographic Correlates of Mexican American Drinking Behavior

Attention is now directed toward understanding the extent to which alcohol consumption varies with sociodemographic characteristics of Mexican Americans. Specific attention is given to age, sex, language, education, income, and marital status and their relationship with category of drinker. The discussion will focus primarily on abstainers and current drinkers.

Age

Although the entire sample population ranges in age from 12 to 74 years, for this analysis the 12- to 17-year-olds (17 percent of the population) are excluded for two reasons. First, more than three-fourths of this group are abstainers, thus skewing the overall distribution significantly. Second, members of this age group are legally denied access to liquor because State laws prohibit sales to minors.

Of the total sample population, 20 percent are between 18 and 24 years, 26 percent between 25 and 34 years, 15 percent between 35 and 44 years, 10 percent between 45 and 54 years, 7 percent between 55 and 64 years, and 4 percent between 65 and 74 years. The data are divided into 10-year intervals, with the exception of the youngest (18 to 24 years), which has been truncated.

The four age groups that make up the population between 18 and 54 have similar patterns of abstainers and current drinkers (figure 9). In each group, current drinkers represent more than 50 percent of the total, and abstainers vary between 30 and 40 percent. For those aged 55 and older, however, the pattern is reversed, with abstainers in the majority. The older age groups also have higher proportions of former drinkers than the younger age groups.

Sex

Mexican Americans are almost equally proportioned by sex: 50.5 percent are male and 49.5 percent are female. Females are more than twice as likely as males to be abstainers (64 percent versus 25 percent, respectively), while males are more than twice as likely as females to be current drinkers (63 percent versus 31 percent, respectively). Males have slightly higher proportions of occasional and former drinkers.

Language

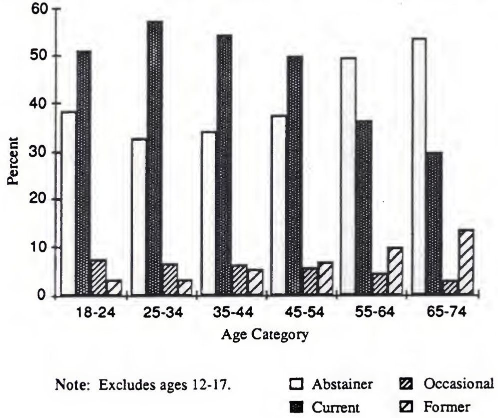
As many as 65 percent of the Mexican Americans spoke English during the survey interview, and 35 percent spoke Spanish. It is not known whether those speaking Spanish could not speak English or whether they simply felt more comfortable conversing in Spanish. It can be presumed, however, that those choosing Spanish are perhaps less acculturated than those speaking English.

Among English-speaking persons surveyed, 50 percent are current drinkers and 40 percent are abstainers. Spanish-speaking respondents have a much higher percentage of abstainers (53 percent) and a lower percentage of current drinkers (37 percent). Both language groups have relatively similar proportions of occasional and former drinkers.

Education

For this particular analysis, youth between the ages of 12 and 16 are excluded on the assumption that the majority are still attending school. Of the remaining population, 28 percent have less than 7 years of education; 32 percent have 7 to 12 years; 23 percent have graduated from high school; and 19 percent have

Figure 9. Classification of drinker types among Mexican Americans by age categories



Note: Excludes ages 12-17.

some college. Overall, slightly more than one-half of the respondents are classified as current drinkers, and about 38 percent are abstainers. Approximately 7 percent are occasional drinkers, and 5 percent are former drinkers.

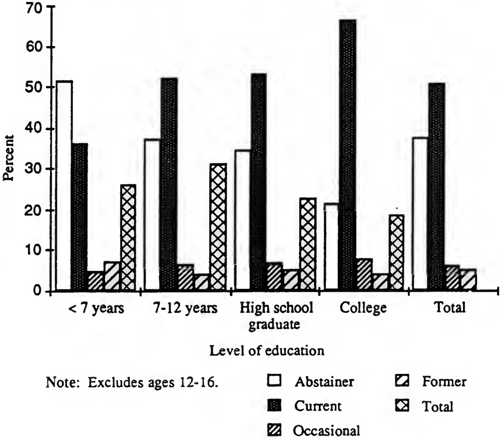
Among persons with the lowest education level, slightly more than 50 percent are abstainers, and about 36 percent are current drinkers (figure 10). As the educational level increases, the proportion of abstainers decreases to a low of 22 percent for respondents with some college education. Conversely, the proportion of current drinkers increases with educational level to a high of 67 percent among those with some college.

Income

Survey data show that as many as one-quarter of all Mexican Americans live in families with annual incomes of less than $10,000, and more than one-half (58 percent) live in families with annual incomes of less than $20,000. On the upper income scale, about 23 percent live in families with annual incomes between $25,000 to $49,999, but less than 2 percent are found in families with annual incomes greater than $50,000. Using the census income classification (with some minor modifications), several important findings are revealed about income and drinker type.

Slightly more than one-half (52 percent) of persons with an annual family income of less than $10,000 are abstainers, representing the largest percentage of any income group. The proportion of abstainers decreases with increasing income. The income group with the lowest percentage of abstainers (28 percent) is found among those at the highest income level, i.e., greater than $50,000. Current drinkers, on the other hand, are proportionately more concentrated in the highest income categories. About two-thirds of those with annual family incomes exceeding $50,000 are current drinkers, while only about 37 percent of the lowest income group are so classified.

Figure 10. Classification of drinker types among Mexican Americans by level of education



Marital Status

Because of limited data across the various marital status categories, two sets of analyses are performed here. The first focuses on married (spouse in household) and single (never married) respondents by all drinker types; the second highlights all marital status categories by current drinkers and abstainers only. In the first analysis, among those who are married (56 percent of Mexican Americans), about one-half are current drinkers, approximately 38 percent are abstainers, and 6 percent are occasional and former drinkers. The pattern for single respondents (26 percent) is reversed: Abstainers make up the largest drinker type (49 percent), with the proportion of current drinkers somewhat smaller (42 percent). Occasional drinkers make up about 8 percent of single persons and former drinkers about 2 percent.

The analysis of all marital status types by current drinkers and abstainers shows that married (spouse not in household), divorced, and separated individuals tend to have higher proportions of current drinkers than abstainers. This finding is particularly true among the group of divorcees, in which current drinkers outnumber abstainers almost 3 to 1. The pattern is reversed among widowed persons with abstainers outnumbering current drinkers by a similar ratio.

Summary and Conclusions

Although the results of this research are preliminary, it is noted that about one-half of all Mexican Americans between the ages of 12 and 74 years are defined as abstainers, a finding reinforced by previous research. In general, abstainers do not drink because they dislike the taste of alcohol and/or have no need for it. Former drinkers, on the other hand, generally do not drink because of health problems or for religious and moral reasons.

More than 80 percent of Mexican American respondents started drinking between 14 and 21 years of age. The largest percentage started drinking alcohol at age 18. Beer is the most favored drink among Mexican American respondents, followed by liquor and wine, but as one becomes a heavier drinker, the probability of consuming all alcoholic beverage combinations becomes greater.

Self-reported drinker categories differ from those constructed objectively. Accordingly, current Mexican American drinkers tend to perceive their alcohol consumption as considerably less than that indicated by the objectively constructed standards.

Several sociodemographic characteristics tend to influence drinking behavior among Mexican Americans. The proportion of current drinkers tends to be highest in age groups between 18 and 54 years, after which it tapers off substantially. Males are considerably more likely to be current drinkers than females, yet the more acculturated females tend to have a higher proportion of current drinkers. Alcohol consumption tends to vary with education and income levels; as both education and income levels increase, so does the proportion of current drinkers.

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Multiple Cause Mortality Data: General Description, Methodological Issues, and Preliminary Findings

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ABSTRACT

This paper examines the differential vulnerability of various racial and ethnic groups to alcohol-related mortality based on analyses of multiple cause of death statistics for 1980 maintained by the National Center for Health Statistics. For specific alcohol-related conditions, looking at death rates alone tends to reduce the magnitude of the problem. Using a recently developed measure–years of potential life lost (YPLL)–this paper presents a more effective way of demonstrating the impact of deaths due to alcohol-related conditions. The YPLL measure is particularly effective when used with alcohol-related conditions because it dramatizes the relatively young age at which victims of alcohol-related conditions die. The average YPLL/death from alcoholic liver disease is tragically high among both males and females of the same race, but there is marked ethnic variation, ranging from 10 years for Japanese males to 22 years for Native American females. The average YPLL/death tends to be even more dramatic for indirect causes of death (e.g., motor vehicle accidents, suicides, homicides). The paper also notes racial and ethnic differences in death certificate mention rates for alcohol dependence and alcoholic liver disease.

Introduction

This paper attempts to measure the differential vulnerability of certain racial and ethnic groups to alcohol-related mortality. Ironically, the least equivocal measure of health is death (Sartwell and Last 1980). Death registration, in one form or another, has been practiced for centuries; however, death certificates were introduced primarily as legal documents rather than as instruments for health research. The history of mortality statistics in the United States is relatively recent. In 1902, the collection of copies of death certificates by a permanent Bureau of the Census was initiated as an annual practice in 10 States and several cities. This so-called Death Registration Area included approximately 40 percent of the U.S. population and did not encompass the entire country until 1932 (Lilienfeld and Lilienfeld 1980).

For many years, national cause-of-death statistics have been based solely on the underlying or primary cause of death, which was selected from the conditions entered by the physician in the cause-of-death section of the death certificate. When more than one cause or condition is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, the provisions of the International Classification of Diseases, and associated classification rules. The underlying cause selects definitionally the initiating condition rather than any intervening condition or the immediate cause, thus omitting information crucial to understanding the overall morbidity process (U.S. Department of Health and Human Services [DHHS] 1984). Much information is lost concerning chronic conditions, such as arthritis, alcoholism, diabetes, and bronchitis, which by themselves may not be fatal but which, in combination with another serious disease, may greatly increase the risk of death (Chamblee and Evans 1982). Conditions and injuries which appear on the death certificate in addition to the underlying cause are known as contributing causes. For example, in 1978 nearly 75 percent of death certificates had more than one condition listed: One-third of the certificates had two conditions, one-fourth had three conditions, and more than one-seventh had four or more conditions listed (DHHS 1984). When so many conditions are reported but only one is tabulated in the mortality statistics, a substantial amount of diagnostic information is lost, particularly information involving alcohol-related conditions.

To utilize the additional information included on death certificates, the National Center for Health Statistics has implemented a multiple-cause-of-death statistical program for disseminating data on all diseases, conditions, and injuries (up to 20 items) entered on the death certificate. Multiple-cause-of-death data are now available for each of the years 1968-1983 and will be released annually (Chamblee and Evans 1982). The use of cause of death information from death certificates is limited in that there are several possible sources of error: (1) The physician completing the death certificate may not be the one who provided medical care to the patient; (2) significant autopsy findings, particularly microscopic pathology, may not be available at the time of submission of the death certificate (although it is possible to amend a death certificate, it is rarely done); and (3) there is a serious lack of recognition among physicians of the importance of death certificate information in advancing medical knowledge. This last item is particularly important in determining morbidity and mortality related to excess consumption of ethanol. The clinician may be unaware of alcohol abuse in the patient or, more often, may wish to spare the survivors the pain of having their loved one stigmatized as an alcoholic (Dufour 1984).

Despite the limitations in this data source, with an excess of 2 million deaths occurring each year in this country, the multiple-cause-of-death data system is an extremely valuable resource. The 1980 multiple-cause-of-death statistics for the entire nation formed the foundation of the analysis reported here (NCHS 1983). The 1980 cause-of-death data were selected for study because 1980 U.S. population figures from the Bureau of the Census were available to provide reliable population denominators for calculating figures such as death rates (Bureau of the Census 1983,1984).

The Concept of Years of Potential Life Lost

In studies of certain common causes of death, such as cancer (all types taken together) or heart disease, statistics are often expressed in terms of death rates. For specific alcohol-related causes of death, where the actual number of deaths is much smaller, looking at death rates alone tends to reduce the magnitude of the problem. A more effective way to demonstrate the impact of deaths due to alcohol-related conditions is to use a recently developed measure, years of potential life lost (YPLL). Using a convention established by the Centers for Disease Control (CDC), ages 1 through 64 are considered the "productive" years of life (CDC 1982): YPLL is then computed as follows.[1]

Computation of Years of Potential Life Lost:

Let A = age at death

$\text{YPLL} = (65 - A)$ for $1 \leq A \leq 65$

$\text{YPLL} = 0$ for $A < 1$ or $A > 65$

The YPLL measure is particularly effective when used with alcohol-related conditions because it highlights the young age at which many victims of alcohol-related conditions die. For example, while the YPLL per individual death for cancer might be 4 years and YPLL per individual death for heart disease might be 2 years, the YPLL per individual death for alcoholic liver disease would be 18 years and YPLL per death for motor vehicle deaths would be 37 years.

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[1] In January 1986, CDC changed the methodology for calculation of YPLL to include years of life lost due to deaths of children under 1 year of age (CDC 1986). Therefore, caution is advised when comparing YPLL data across studies.

Alcohol-Related Causes of Death

Alcohol-related causes of death can be divided into two basic types: direct and indirect. Direct causes are medical conditions that arise as a result of excessive alcohol consumption. Because of the structure of the Ninth Revision of the International Classification of Diseases (International Classification of Diseases [ICD] 1980), it is not possible to identify and tabulate every alcohol-related cause of death. The chart lists the causes of deaths selected for analysis that are a direct result of alcohol use.

Cause of death and ICD-9-CM code number[a]

Alcohol dependence 303
Alcoholic liver disease 571.0-571.3
Other liver disease 571.4-571.9
Alcohol abuse 305.0
Excess blood level of alcohol 790.3
Alcoholic psychosis 291
Alcoholic cardiomyopathy 425.5
Alcoholic gastritis 535.3
Alcoholic polyneuropathy 357.5

Alcohol dependence (303) includes entities such as acute alcoholic intoxication, acute drunkenness in alcoholism, chronic alcoholism, and dipsomania ("an uncontrollable urge for spiritous drink"). There are many ideas as to what precisely constitutes "alcohol dependence," ranging from a broad definition that dependence on alcohol exists when it is taken in amounts sufficient to interfere with interpersonal relationships, psychologic functioning, or physical health to a more narrow definition that requires the presence of actual physical withdrawal symptoms before a patient can be labeled as "dependent" (ICD 1980).

Alcoholic liver disease (571.0-571.3) includes alcoholic fatty liver (571.0), acute alcoholic hepatitis (571.1), alcoholic cirrhosis (571.2), which includes such terms as "florid cirrhosis" and "Laennec's cirrhosis," and alcoholic liver damage, unspecified (571.3). Other liver disease (571.4-571.9) includes cirrhosis of the liver without mention of alcohol (571.5), biliary cirrhosis (571.6), other chronic nonalcoholic liver disease (571.8), and unspecified chronic liver disease without mention of alcohol (571.9).

In many past studies, all liver disease coded to 571 was analyzed as a group without separation of those diseases specifically designated as alcohol related. Very few people would argue with the premise that virtually 100 percent of all liver disease designated as alcoholic is probably alcohol related. However, this aggregation technique has been criticized strongly by individuals who contend that very little "other" liver disease is actually alcohol related, and that to count all cirrhosis as alcohol related is unreasonable. On the other hand, some experts estimate that as much as 90 percent of all liver disease is alcohol related. To address this controversy, alcoholic liver disease and "other" liver disease were tabulated separately. Those who are more conservative can evaluate only the alcoholic liver disease category. Those seeking a broader interpretation can evaluate both categories of liver disease (ICD 1980).

Alcohol abuse (305.0) is classified as the "nondependent abuse of drugs" (305) and includes drunkenness not otherwise specified (NOS), excessive drinking of alcohol NOS, "hangover," and inebriety NOS. This category is intended to include such episodes as the teenager who crashes into a tree after downing a six-pack of beer. If this is the individual's first experience drinking beer, he clearly cannot be dependent but yet has abused the substance.

Excessive blood level of alcohol (790.3), also referred to as elevated blood-alcohol, is not defined much beyond this term in the ICD classification scheme. A specific blood-alcohol concentration is not listed, probably because what would be an "excessive level" for an inexperienced drinker would not necessarily be excessive for a tolerant, chronic heavy drinker. This code seems to appear most frequently on certificates where no other clear-cut cause of death could be determined and toxicological laboratory tests revealed a significant blood alcohol concentration.

The category of alcoholic psychoses (291) includes a variety of disease entities: alcohol withdrawal delirium (291.0), Korsakoff's psychoses and Wernicke-Korsakoff syndrome (291.1), alcoholic dementia and chronic alcoholic brain syndrome (291.2), alcoholic hallucinosis (291.3), and alcohol abstinence (withdrawal) syndrome or symptoms (291.8). Alcoholic cardiomyopathy (425.5), alcoholic gastritis (535.3), and alcoholic polyneuropathy (357.5) complete the list of direct alcohol-related causes of death (ICD 1980).

Indirect causes of death are external situations that do not define the precise nature of the fatal injury or condition. For example, the indirect cause of death may be a fall, but the nature of injury may be depressed skull fracture and bleeding into the brain. In addition to falls, the other indirect causes of death associated with alcohol use are: motor vehicle accidents, fires, homicides, and suicides. It is important to note here that all deaths from these five causes occurring in 1980 were included in the analysis, not only those specifically coded as alcohol related: The reason for this is that the "alcohol-relatedness" of these particular causes of death is notoriously underreported on death certificates. For example, using death certificate data alone, less than 2 percent of motor vehicle deaths are coded as alcohol related, yet data from the National Highway Transportation and Safety Administration reveal that approximately 50 percent of all traffic deaths are alcohol related (Dufour et al. 1984). Furthermore, numerous studies suggest that a significant proportion of deaths due to falls, fires, homicides, and suicides are alcohol related. However, the lack of a systematic fatal injury surveillance and reporting system makes quantification of the alcohol relatedness of those types of death very difficult at the present time. Therefore, the decision was made to analyze all deaths due to these five indirect causes.

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[a] Code numbers are taken from ICD 1980.

Race, Ethnicity, and Causes of Death

On death certificates, nine racial or ethnic categories are distinguished: white, black, Native American, Chinese, Japanese, Hawaiian, Filipino, other Pacific Islanders, and all others. The category "Native American" includes American Indians, Aleuts, and Eskimos. "Other Pacific Islanders" includes groups such as Guamanians and Samoans. Because of serious difficulties in obtaining comparable census data for "Other Pacific Islanders," this group together with the "All other" group was excluded from further analysis.

A major limitation of death certificate data is the inability to study those of Hispanic origin because this designation does not appear on the certificate. Plans are currently under way for revising the standard death certificate form, and it is likely that it will be possible to distinguish those of Hispanic heritage in the future.

Analysis of Data on Causes of Death

Ratios of Total Deaths to Selected Underlying Causes

It is important to emphasize that some alcohol-related conditions are much more likely to cause death than others and are therefore more likely to be listed as an underlying cause of death rather than as a contributing cause. For example, table 1 shows that alcoholic liver disease is listed as an underlying cause for white males more than five times as often as it is listed as only a contributing cause. For Native American males, this ratio is more than 12 to 1. The discrepancy between the ratios for white males and Native American males also raises the important issue of reporting bias. Some physicians may be inclined to attribute a death to alcoholic liver disease in some racial and ethnic groups more than in other groups. Table 1 also demonstrates that alcohol dependence almost always appears as a contributing rather than an underlying cause of death, although again the racial reporting bias is evident, but to a lesser degree.

Deaths and Death Rates

Tables 2 and 3 list total death certificate mentions for each of the previously discussed direct and indirect causes of death for males and females respectively, by selected racial/ethnic groups in the United States in

Table 1.—Ratios of underlying to contributing cause of death

	Alcoholic liver disease (571.0-.3)		Alcohol dependence (303)	
Racial group	Male	Female	Male	Female
White	5.32	6.88	0.29	0.28
Black	5.91	6.54	.36	.39
Native American	12.62	7.69	.47	.49

Table 2.–Total death certificate mentions, males, United States, 1980

Cause of death (ICD-9-CM)	Race/ethnicity White	 Black	 Native American	 Chinese	 Japanese	 Hawaiian	 Filipino
Alcohol dependence (303)	10,219	3,634	274	7	4	5	7
Alcoholic liver disease (571.0-.3)	8,664	1,872	177	11	7	4	12
Other liver disease (571.4-.9)	19,637	3,567	198	46	33	9	32
Alcohol abuse (305.0)	2,794	721	112	3	1	1	4
Excess blood level of alcohol (790.3)	865	237	19	1	1	0	2
Alcoholic psychosis (291)	455	184	8	0	0	0	0
Alcoholic cardio-myopathy (425.5)	432	238	2	1	0	0	1
Alcoholic gastritis (535.3)	70	25	3	0	0	0	0
Alcoholic poly-neuropathy (357.5)	10	0	0	0	0	0	0
Motor vehicle deaths (E810-825)	34,327	3,917	525	44	47	38	54
Falls (E880-889)	6,165	776	52	16	18	2	11
Fires (E890-899)	2,569	954	33	2	3	0	1
Homicide (E960-969)	10,251	8,278	163	36	21	13	26
Suicide (E950-959)	18,929	1,298	148	37	43	16	20

1980. Death certificate mentions rather than actual deaths have been tabulated because in many cases more than one alcohol-related condition appears on a single death certificate. For example, an individual may have had both alcohol dependence and alcoholic liver disease. In other words, the number of death certificate mentions is not additive across disease entities and must be viewed separately. The actual number of death certificate mentions for a given cause for a given race and sex lacks meaning without a population base of the same race and sex for comparison. Therefore, a more meaningful statistic is the death certificate mention rate, calculated after the fashion of traditional death rates. For example:

$$\begin{array}{l}\text{Death certification mention}\\ \text{rate for alcohol dependence}\\ \text{(303) for white males}\end{array} = \frac{\begin{array}{l}\text{Number of death certificates}\\ \text{for white males where 303}\\ \text{appears}\end{array}}{\begin{array}{l}\text{U.S. population of white}\\ \text{males (1980 census)}\end{array}}$$

Table 3.–Total death certificate mentions, females, United States, 1980

Cause of death (ICD-9-CM)	White	Black	Native American	Chinese	Japanese	Hawaiian	Filipino
Alcohol dependence (303)	2,803	1,175	119	2	0	0	1
Alcoholic liver disease (571.0-.3)	3,336	928	113	2	0	1	2
Other liver disease (571.4-.9)	10,720	2,053	147	12	19	5	8
Alcohol abuse (305.0)	932	198	25	0	0	0	0
Excess blood level of alcohol (790.3)	183	45	9	0	0	0	0
Alcoholic psychosis (291)	65	51	0	0	0	0	0
Alcoholic cardiomyopathy (425.5)	66	33	4	0	0	1	0
Alcoholic gastritis (535.3)	12	3	1	0	0	0	0
Alcoholic polyneuropathy (357.5)	2	1	0	0	0	0	0
Motor vehicle deaths (E810-825)	12,814	1,171	230	29	30	19	29
Falls (E880-889)	5,875	348	18	7	10	1	2
Fires (E890-899)	1,605	630	15	2	0	1	1
Homicide (E960-969)	3,182	1,899	55	12	6	6	9
Suicide (E950-959)	5,938	311	34	30	21	1	7

Based on the rates for males for alcohol dependence, Japanese, Chinese, and Filipinos have the lowest death certificate mention rates, followed by Hawaiians (table 4). Whites have intermediate rates, followed by blacks, with Native Americans having the highest rates. The same pattern is seen for alcoholic liver disease. The pattern for other liver disease is somewhat different, probably due to a number of interactive factors. The rates for blacks and Native Americans are similarly high, followed by the rates for whites. However, if one compares the rate of alcoholic liver disease with the rate of other liver disease for a given race, the ratio for whites is markedly lower than for blacks or Native Americans. This suggests a reporting bias in that more truly alcohol-related liver disease may actually be coded as "other liver disease" than is the case for blacks or Native Americans. The similarly low ratios for Chinese, Japanese, Filipinos, and Hawaiians could be explained on the basis of reporting bias but more likely reflect the higher incidence of posthepatitic cirrhosis among these groups. Similar racial patterns are seen for alcohol abuse and excess blood level of alcohol, except that there were no deaths from excess blood level of alcohol among Hawaiians. Trends are basically similar for the remaining direct causes, although the actual number of deaths from these causes is very small.

The racial patterns of death rates for the indirect causes are somewhat different. Chinese, Japanese, and Filipinos have the lowest rates for motor vehicle deaths, followed by blacks and whites. Hawaiians rank second and Native Americans first. For death from falls, rates are quite similar across races. Black males have the highest death rates from fires, followed by Native Americans and whites. The other racial groups have very small rates, with no deaths reported for Hawaiians. Black males have dramatically high death rates from homicide, followed by Native Americans, Hawaiians, whites, Chinese, Filipinos, and Japanese.

Table 4.—Death certificate mention rates per 100,000 population, males, United States, 1980

Cause of death (ICD-9-CM)	Race/ethnicity						
	White	Black	Native American	Chinese	Japanese	Hawaiian	Filipino
Alcohol dependence (303)	10.8	28.8	39.0	1.7	1.2	6.1	1.9
Alcoholic liver disease (571.0-.3)	9.1	14.8	25.2	2.7	2.2	4.9	3.2
Other liver disease (571.4-.9	20.7	28.3	28.2	11.3	10.3	10.9	8.6
Alcohol abuse (305.0)	2.9	5.7	15.9	.7	.3	1.2	1.1
Excess blood level of alcohol (790.3)	.9	1.9	2.7	.2	.3	—	.5
Alcoholic psychosis (291)	.5	1.5	1.1	—	—	—	—
Alcoholic cardio-myopathy (425.5)	.5	1.9	.3	.2	—	—	.3
Alcoholic gastritis (535.3)	.074	.2	.4	—	—	—	—
Alcoholic poly-neuropathy (357.5)	.011	—	—	—	—	—	—
Motor vehicle deaths (E810-825)	36.2	31.1	74.8	10.8	14.6	46.2	14.4
Falls (E880-889)	6.5	6.2	7.4	3.9	5.6	2.4	2.9
Fires (E890-899)	2.7	7.6	4.7	.5	.9	—	.3
Homicide (E960-969)	10.8	65.6	23.2	8.8	6.5	15.8	6.9
Suicide (E950-959)	19.9	10.3	21.1	9.1	13.4	19.5	5.3

Table 5.—Death certificate mention rates per 100,000 population, females, United States, 1980

Cause of death (ICD-9-CM)	Race/ethnicity						
	White	Black	Native American	Chinese	Japanese	Hawaiian	Filipino
Alcohol dependence (303)	2.8	8.4	16.6	0.5	—	—	0.3
Alcoholic liver disease (571.0-.3)	3.4	6.6	15.7	.5	—	1.2	.5
Other liver disease (571.4-.9	10.7	14.6	20.5	3.0	5.0	5.9	2.0
Alcohol abuse (305.0)	.9	1.4	3.5	—	—	—	—
Excess blood level of alcohol (790.3)	.2	.3	1.3	—	—	—	—
Alcoholic psychosis (291)	.065	.4	—	—	—	—	—
Alcoholic cardio-myopathy (425.5)	.066	.2	.6	—	—	1.2	—
Alcoholic gastritis (535.3)	.012	.021	.1	—	—	—	—
Alcoholic poly-neuropathy (357.5)	.002	.007	—	—	—	—	—
Motor vehicle deaths (E810-825)	12.8	8.3	32.0	7.3	7.9	22.5	7.2
Falls (E880-889)	5.9	2.5	2.5	1.8	2.6	1.2	.5
Fires (E890-899)	1.6	4.5	2.1	.5	—	1.2	.3
Homicide (E960-969)	3.2	13.5	7.7	3.0	1.6	7.1	2.2
Suicide (E950-959)	6.0	2.2	4.7	7.5	5.5	1.2	1.7

Table 6.—Rates of YPLL for males per 100,000 population, ages 1-64, United States, 1980

Cause of death (ICD-9-CM)	Race/ethnicity						
	White	Black	Native American	Chinese	Japanese	Hawaiian	Filipino
Alcohol dependence (303)	117.2	459.1	769.8	33.6	18.2	101.8	23.9
Alcoholic liver disease (571.0-.3)	98.6	253.3	527.3	20.1	16.5	9.3	17.2
Other liver disease (571.4-.9	177.7	469.9	489.8	68.4	84.0	109.7	56.2
Alcohol abuse (305.0)	72.9	131.5	458.8	6.3	14.5	26.1	17.8
Excess blood level of alcohol (790.3)	29.4	52.1	100.3	1.9	4.4	—	26.5
Alcoholic psychosis (291)	4.6	25.3	28.6	—	—	—	—
Alcoholic cardio-myopathy (425.5)	4.8	32.6	5.2	—	—	—	—
Alcoholic gastritis (535.3)	1.8	3.7	5.8	—	—	—	—
Alcoholic poly-neuropathy (357.5)	.06	—	—	—	—	—	—
Motor vehicle deaths (E810-825)	1,346	1,051	2,744	320.6	497.1	1,908.7	377.0
Falls (E880-889)	68	106	154	9.2	11.8	—	—
Fires (E890-899)	72	215	157	8.2	54.0	32.6	28.5
Homicide (E960-969)	368	2,300	494	257.2	165.3	582.3	184.0
Suicide (E950-959)	526	336	840	239.2	321.8	629.3	151.7

Table 7.—Rates of YPLL for females per 100,000 population, ages 1-64, United States, 1980

Cause of death (ICD-9-CM)	Race/ethnicity						
	White	Black	Native American	Chinese	Japanese	Hawaiian	Filipino
Alcohol dependence (303)	33	159	372	4.7	—	—	3.9
Alcoholic liver disease (571.0-.3)	40	121	349	4.7	—	20.7	8.6
Other liver disease (571.4-.9	83	247	379	8.9	24.6	98.2	15.5
Alcohol abuse (305.0)	20	32	97	—	—	—	—
Excess blood level of alcohol (790.3)	4.8	9.2	43.3	—	—	—	—
Alcoholic psychosis (291)	.6	9.5	—	—	—	—	—
Alcoholic cardio-myopathy (425.5)	.8	4.6	13.2	—	—	20.7	—
Alcoholic gastritis (535.3)	.2	.5	4.2	—	—	—	—
Alcoholic poly-neuropathy (357.5)	.005	—	—	—	—	—	—
Motor vehicle deaths (E810-825)	448	302	1,249	211.4	195.6	633.8	270.9
Falls (E880-889)	16	25	24	2.8	—	—	—
Fires (E890-899)	40	140	65	—	—	—	—
Homicide (E960-969)	108	494	271	77.9	60.8	285.7	75.7
Suicide (E950-959)	151	71	173	141.0	137.5	58.2	56.6

Table 8.—Average YPLL per individual death for alcoholic liver disease and motor vehicle deaths

Race/ ethnicity	Alcoholic liver disease (571.0-.3) Male (years)	Alcoholic liver disease (571.0-.3) Female (years)	Motor vehicle deaths (E810-825) Male (years)	Motor vehicle deaths (E810-825) Female (years)
White	13	12	36	36
Black	18	18	34	37
Native American	21	22	37	37
Chinese	15	9	34	36
Japanese	10	–	36	28
Hawaiian	15	16	40	40
Filipino	12	16	36	36

For suicide, white, Native American, and Hawaiian males have similarly high rates, followed by Japanese, blacks, Chinese, and Filipinos.

The patterns for women are very similar to those for the men across races and conditions, although the death rates for women are uniformly much lower (table 5). It is important to note, however, that for some conditions death rates for women of a given race may be higher than those for males of another race for the same conditions. In many cases, the rates for females are based on small numbers. For example, the unusually high death rate for Hawaiian women from alcoholic cardiomyopathy is based on one death.

Years of Potential Life Lost and Rates of YPLL

As previously mentioned, YPLL is calculated as follows:

Let A = age at death

$\text{YPLL} = (65 - A) \text{ for } 1 \leq A \leq 65$

$\text{YPLL} = 0 \text{ for } A < 1 \text{ or } A > 65$

Using white males as an example, YPLL rates were calculated as follows:

$$\text{YPLL rate for white males for alcohol dependence (303)} = \frac{\text{Total YPLL for white males for 303}}{\text{U.S. population of white males aged 1-64 (1980 census)}}$$

As shown in tables 6 and 7, the YPLL rates basically follow the same racial distribution pattern. Since the YPLL methodology highlights deaths at younger ages, YPLL rates for motor vehicle deaths and homicide are striking. The relatively younger age at which people die from alcohol-related conditions is further dramatized by evaluating the average YPLL per individual death from a given condition. The average YPLL/ death from alcoholic liver disease by race and sex is shown in table 8. The actual number of years lost is quite similar between males and females of the same race, but there is a marked racial variation, ranging from 10 years for Japanese males to 22 years for Native American females. The YPLL per death tends to be even more dramatic for the indirect causes, as shown in table 8, which includes the YPLL per death from motor vehicle accidents by race and sex. With the exception of the Japanese (36 years for males and 28 years for females), there is very little variation between sexes or among races. The number of years of life lost per individual is tragically high.

Conclusion

In summary, the multiple-cause-of-death data files are a large and rich resource for investigating alcohol-related mortality among the various racial and ethnic groups. The results of this study must be interpreted cautiously, however. No racial group is homogenous: Statistics presented here indicate, for example, that alcohol-related mortality is a serious problem among Native Americans. Other research has confirmed this to be true among Native Americans of certain tribal affiliations in specific geographic locations. Other tribes have less alcohol-related mortality than whites living in the same region.

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The Incidence of and Survival From Alcohol-Related Cancers in U.S. Minorities

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ABSTRACT

Epidemiological studies have shown the intake of alcohol to be associated with cancers of the oral cavity, larynx, esophagus, stomach, rectum, and liver. Alcohol has also been suggested as a risk factor for cancer of the pancreas and prostate, although the association is weak and the increased risk, if any, is small. No association has been shown between alcohol and cancers of the urinary system. Data for 1978-1981 from the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute (NCI) were examined for these cancer sites to contrast the risk in incidence between whites, blacks, Chinese, Japanese, Filipinos, Hawaiians, American Indians, and Hispanics in New Mexico and Puerto Rico. This examination revealed that males experience an excess risk in the incidence of alcohol-related cancers. For cancers of the oral cavity and esophagus, blacks, Chinese, and Puerto Ricans experience higher risks. For cancer of the stomach, all minority groups except for Chinese and Filipinos experience a higher risk than whites. For cancers of the rectum, Japanese are the only minority at an increased risk. Both blacks and Hispanics experience an increased risk of pancreatic cancer. Blacks, Hawaiians, and Hispanics are at an increased risk of laryngeal cancer. Five-year relative survival rates for these cancer sites were also examined for the various ethnic groups except Puerto Ricans. In general, blacks and American Indians had lower survival rates than did whites, while Japanese had higher survival rates. Rates for Hispanics were similar to those for other Caucasians.

Introduction

Cohort and case-control studies have examined the relationship between alcohol intake and cancer incidence and/or mortality. Comprehensive reviews of the relevant literature on these relationships are contained in *Persons at High Risk of Cancer* (Fraumeni 1975) and *Cancer Epidemiology and Prevention* (Schottenfeld and Fraumeni 1982). The strongest associations were noted for cancers of the oral cavity, pharynx, and esophagus. Associations were also observed between alcohol intake and cancers of the stomach, liver, rectum, and larynx. Weak associations have been noted for cancers of the pancreas and prostate. No associations have been noted between alcohol intake and cancers of the urinary system.

The incidence of these alcohol-related cancers in the United States varies among the racial and ethnic groups for whom data are available. The remainder of this paper will be devoted to an examination of the occurrence of these cancers among whites, blacks, Chinese, Japanese, Filipinos, Hawaiians, American Indians, and New Mexico Hispanics.

Materials and Methods

In response to the National Cancer Act, the National Cancer Institute (NCI) established a program to monitor the incidence of and mortality and survival from cancer in the United States. This program, entitled the Surveillance, Epidemiology, and End Results (SEER) Program, began in 1973 and covers a 10 percent sample of the U.S. population. Figure 1 shows the geographic areas included in the SEER Program in 1985. Recently, to augment the coverage of data on blacks and Hispanics, the State of New Jersey was added to the program; however, no data for New Jersey are included in this report. The SEER Program has been described in detail elsewhere (Young et al. 1981). In brief, NCI contracts with medically oriented nonprofit organizations within the geographic areas included in the program to establish a cancer reporting system.

Medical and demographic data are recorded on each case of cancer diagnosed in a resident of the area, and the patient is then followed annually thereafter to ascertain length of survival as well as the development of any subsequent primary cancers. Information then is submitted to NCI annually. Identification of the patient's race or ethnicity generally is determined from the hospital record or death certificate. However, in the case of New Mexico Hispanics, the determination of Hispanic ethnicity is made on the basis of the patient's last name. Annual estimates of the population-at-risk are obtained either from the U.S. Bureau of the Census or from the appropriate responsible local State agency.

Data presented for American Indians in the incidence portion of this paper are based entirely upon the American Indian population of New Mexico. Data for Japanese, Chinese, and Filipinos are a composite of those groups residing in San Francisco/Oakland area of California and in the State of Hawaii. Data for Hawaiians are based on those of pure- or Part-Hawaiian descent and who still reside in Hawaii.

Results

The data included in this paper cover the years 1978-1981. Incidence rates are presented in table 1 for males and females combined because numbers of cases for several of the minority groups are quite small. All rates have been age adjusted by the direct method to the 1970 U.S. population. In general, for each site discussed and within each racial and ethnic group, males were at a higher risk to the cancer than females. The male-to-female ratio was highest for cancers of the larynx and esophagus.

Cancers of the Oral Cavity and Pharynx

Both alcohol and tobacco have been established as risk factors for cancers of the oral cavity (Rothman and Keller 1972). The estimated risk ratio for oral cancer among heavy smokers and heavy drinkers is 15.5 compared with people who are nonsmokers and nondrinkers. These cancers account for less than 4 percent of all malignant neoplasms. Within the oral cavity, cancers occurred most frequently on the lip, tongue, and gum, although none of these individual sites accounted for as much as 1 percent of all malignancies. The greatest risk to oral cancers is seen among the Puerto Ricans. However, this excess occurs almost entirely among the males whose relative risk compared to whites is 1.68. Blacks and Chinese also experience a higher risk than whites, while Japanese and American Indians are at a decreased risk. In fact, during the years 1978-1981, there were no cases of oral/pharyngeal cancers reported among American Indian males.

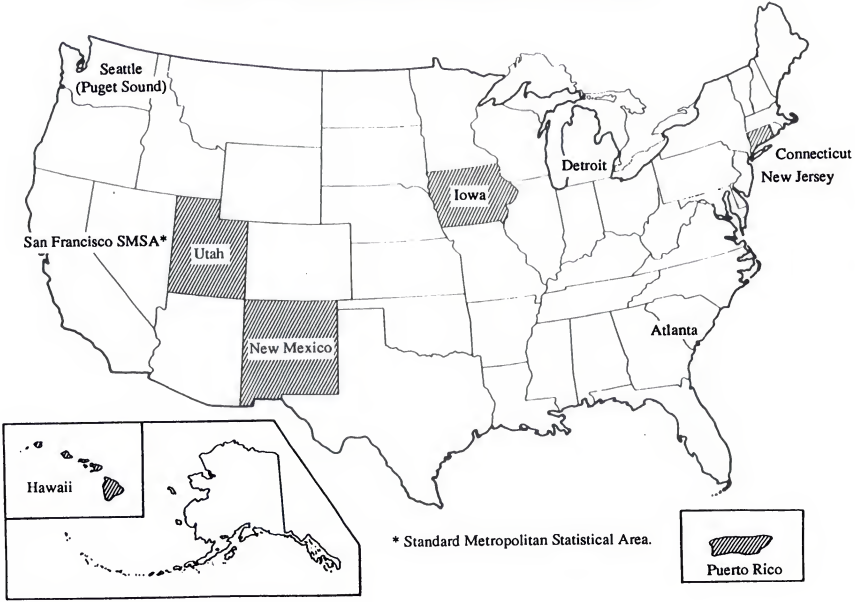
Esophagus

Alcohol and tobacco also have been the major factors associated with esophageal cancer, with alcohol having the greatest effect (Martinez 1969). The highest U.S. rates were noted among blacks and Puerto Ricans; both groups had rates almost four times those of whites. Of particular interest is the fact that the rates among Puerto Ricans were eight times those for New Mexico Hispanics. This increased risk was noted for both males and females. Hawaiians had rates which were twice those for whites. Each of the other groups experienced esophageal cancer risks similar to those for whites.

Stomach

There is conflicting evidence with regard to the relation of alcohol intake and stomach cancer. An association with cancer of the stomach cardia has been shown (MacDonald 1973), but there was no association with cancers occurring in other stomach subsites. In the United States, higher stomach cancer incidence rates were reported for each of the minorities except for Chinese and Filipinos. In contrast to esophageal cancer, the similarity of rates among the Puerto Ricans

Figure 1. Geographic location of areas included in the Surveillance, Epidemiology, and End Results (SEER) Program of the National Cancer Institute, 1985



* Standard Metropolitan Statistical Area.

Table 1.—Age-adjusted (1970 U.S. standard) incidence rates per 100,000 population for selected primary sites by ethnic group, males and females combined, SEER Program, 1978-1981

Primary site	Whites	Blacks	Chinese	Japanese	Filipinos	Hawaiians	American Indians	New Mexico Hispanics	Puerto Ricans
Oral cavity	11.0	14.6	15.6	4.8	10.2	9.6	1.0	6.8	16.8
Esophagus	2.9	11.5	3.4	2.4	3.6	6.4	2.4	1.6	10.4
Stomach	8.0	13.8	9.2	27.8	6.8	32.4	19.3	15.7	17.5
Rectum	15.0	11.7	13.0	16.4	12.1	14.3	1.9	9.4	7.3
Liver	1.7	3.4	10.7	4.8	5.6	6.3	2.1	3.1	3.0
Pancreas	8.9	13.6	9.4	7.5	6.6	10.0	6.0	10.8	5.6
Larynx	4.6	6.6	1.9	2.6	1.8	5.2	.9	2.6	4.5
Lung	50.7	69.0	45.4	28.1	28.9	68.0	8.4	22.9	15.1
Prostate gland[a]	75.1	120.3	26.0	44.4	48.5	57.9	45.4	76.5	43.4
Bladder	15.4	8.6	8.7	8.5	5.2	8.2	1.1	8.2	8.4
Kidney	6.8	6.6	3.3	4.4	2.0	6.4	7.0	6.4	2.2

[a] Rate per 100,000 males.

and New Mexico Hispanics should be noted. Rates for Hawaiians and Japanese were four times those for whites, while those for blacks, American Indians, and Hispanics were double the rates for whites. Interestingly, a study of the geographic distribution of stomach cancer in Japan was correlated with consumption of sake (Hirayama 1971).

Colon and Rectum

The incidence of colorectal cancer is usually inversely related to stomach cancer in that populations at high risk to stomach cancer are at low risk to colorectal cancer. The association of alcohol intake with colorectal cancer is not strongly established, with most studies showing only a weak association between beer consumption and rectal (but not colon) cancer; thus, only data for rectal cancer are presented here. It should be noted, however, that data for colon and rectum often are analyzed together rather than separately because of the difficulty in distinguishing where the colon ends and the rectum begins. Also, studies of the accuracy of death certificates (Percy et al. 1981) have shown that deaths of persons with rectal carcinoma are frequently certified to colon cancer and vice versa.

As can be seen in table 1, the Japanese were at highest risk to rectal cancer even though they were also at high risk to stomach cancer. (The same relationship holds when the colon and rectum are considered together.) American Indians, New Mexico Hispanics, and Puerto Ricans, on the other hand, fit the classic pattern of low rectal cancer incidence coinciding with a high incidence of stomach cancer. Incidence rates among males and females were much closer, with only the Filipinos having a male-to-female ratio greater than two.

Liver

Liver cancer has been shown to occur with increased frequency among alcoholics with cirrhosis (Lee 1966). Each of the eight minority groups experienced a liver cancer incidence greater than that for whites, with the rates being the highest among the Oriental groups. In fact, Chinese males had rates of liver cancer that were seven times those of their white counterparts. It is interesting to note that liver cancer is one of the most frequent forms of cancer in Africa and Asia, while in the United States, primary liver cancer accounts for less than 1 percent of all malignancies.

Pancreas

The association of alcohol with pancreatic cancer is weak at best. One case-control study (Burch and Ansari 1968) and one interview survey (Williams and Horm 1977) show an increase of pancreatic cancer among heavy drinkers. The rate for Hispanics in New Mexico is almost double that for Puerto Ricans. This increased rate is in contrast to the pattern for esophageal cancer noted above, where the higher rates are experienced by Puerto Ricans. The highest risk for pancreatic cancers is experienced by blacks.

Larynx

Alcohol has been shown to play a role in the development of laryngeal cancer (Wynder et al. 1956), although heavy smoking is a much stronger risk factor. Laryngeal cancer occurs three to five times more frequently among men than women and accounts for less than 2 percent of all malignancies. Only blacks and Hawaiians experienced rates greater than those for whites. All other minorities except for Puerto Ricans had a rate which was almost double that of New Mexico Hispanics.

Lung

One study (Hirayama 1975) has suggested an association of lung cancer with alcohol. However, when corrected for smoking history, the excess of lung cancer among drinkers disappeared. The pattern noted among the minorities is almost identical to that for laryngeal cancer with the exception of the very low rate among the Puerto Ricans. Again, only blacks and Hawaiians are at a greater risk than whites, although the rate among Chinese is only slightly lower than that for whites.

Prostate

One study has suggested a weak association of alcohol intake with prostate cancer (Lowenfels 1974). Blacks are the only minority group with an excess risk of prostate cancer compared to whites, although New Mexico Hispanics have a risk equal to that for whites.

Urinary System

No study has shown an association of alcohol with cancers of the urinary system such as bladder and kidney cancer. Members of every minority group studied, particularly American Indians, are at a lower risk to bladder cancer than whites. With respect to kidney cancers, the risk is essentially equal among whites, blacks, American Indians, and New Mexico Hispanics. Thus, there is a considerable variation in risk among minority populations for the nonalcohol-related as well as the alcohol-related cancer sites.

Survival Data

Of equal interest to the occurrence of cancer among minorities is the survival from cancer once it has been diagnosed. Table 2 shows 5-year relative survival rates among whites and minorities. These data are also based on the SEER Program experience, but include patients diagnosed between 1973-1981. Survival rates have been calculated by the actuarial method and have been corrected for normal life expectancy. Survival data for Puerto Ricans were not available for this portion of the analysis. In the survival analysis, a few Aleuts and Eskimos residing in the Seattle/Puget Sound area have been included with the American Indians, hence the category of Native Americans. Also, the term "Anglo" has been used to distinguish the category of Caucasians not of Hispanic origin.

With respect to cancers of the oral cavity, the poorest survival was experienced by the blacks, who were also at a high risk to the disease. Relatively poor survival was also experienced by Native Americans.

Cancer of the esophagus had uniformly poor survival for all minority groups. The 5-year relative survival for all races combined was only 4 percent, and only blacks, Anglos, and Hispanics had any 5-year survivors.

Survival from stomach cancer was uniform except for Native Americans and Japanese. Japanese patients had a 5-year relative survival rate which was double that for whites. This difference persisted even when the data were examined by stage of disease at the time of diagnosis, with the exception that patients with stage IV (distant) disease in both groups had uniformly poor survival. The difference in survival has been hypothesized to be due to differences in the histologic type of stomach cancer between whites and blacks, but the pathologic detail available did not allow such a comparison to be made. The difference in survival between Japanese and Anglos persisted even when geographic area was taken into account; i.e., the difference was noted for Japanese in both Hawaii and San Francisco.

Racial differences for rectal cancer survival were similar to those for stomach cancer, with the Japanese having the best survival rate and Native Americans the poorest. However, blacks also had a low survival compared to whites. Survival for other minorities was similar to those for whites.

Survival from liver cancer was also uniformly poor among all groups studied, with a 5-year relative survival rate for all races combined of only 3 percent. The same was true for survival from pancreatic cancer, where the 5-year relative survival rate for all races combined was also only 3 percent. Even the 1-year relative rates for these sites were discouragingly low at 13 percent and 15 percent for liver and pancreas, respectively.

There were not enough cases of laryngeal cancer among Native Americans to yield a meaningful analysis. The very best survival was experienced by the Hawaiians and Japanese and the poorest by Hispanics, blacks, and Filipinos. This is one of only a few sites for which survival was poorer for Hispanics compared to Anglos.

For prostatic cancer, Native Americans and blacks experienced the poorest survival, although only the former had a rate below 50 percent. It is of interest to note that the survival rates for Anglos and Hispanics were lower than those for the four other minority groups.

Finally, for comparison purposes, the 5-year survival rates for bladder cancer were examined. Two distinct groups are seen, those with 5-year relative survival rates greater than 70 percent and those with rates 50 percent or less. Again, blacks and Native Americans fall into the group with poorer survival. Thus, the pattern of poorer survival for these two minorities is by no means limited to the alcohol-related cancers.

Discussion

The exact role of alcohol in the development of and survival from cancer is difficult to assess due to the confounding effect of tobacco consumption and perhaps other lifestyle factors such as diet. Rothman (1975) has estimated that there is about a 7 percent increase in cancer deaths among males and 2 percent among females over what would be expected in the absence of alcohol consumption. It seems clear that for many of the sites discussed, alcohol may be a promoter or a cocarcinogen rather than a carcinogen. Further, since alcohol consumption may displace essential nutrients in the diet, survival rates could be affected even for the nonalcohol-related cancers.

Table 2.—Five-year relative survival rates (percent) for selected primary sites by ethnic group, males and females combined, SEER Program, 1973-1981

Primary site	Anglos	Blacks	Chinese	Japanese	Filipinos	Hawaiians	Native Americans	Hispanics
Oral cavity	53	35	52	49	52	50	43	51
Stomach	14	15	15	28	15	14	9	16
Rectum	49	37	44	55	45	42	24	44
Larynx	67	59	67	75	57	79	—	60
Prostate gland	69	59	76	76	73	85	47	70
Bladder	74	50	74	72	49	48	37	70

—=Too few cases to yield meaningful results.

Thus it remains for further laboratory tests and tests of mutagenicity and carcinogenicity to determine the true relationship between alcohol intake and cancer, since the main effect observed to date is that of total ethanol intake regardless of whether it comes from wine, beer, or spirits. It is clear, however, that a reduction in the consumption of alcohol among moderate and heavy drinkers would be an effective cancer control measure.

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VI.

Issues and Recommendations

Methodological Issues in Alcohol Research on Ethnic Minorities: Sources of Bias

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During the conference it became apparent that most minority or ethnic groups in the United States are affected by many of the same problems regarding the epidemiology of alcohol use and abuse. This is not to say that these problems affect all people in the same way or to the same extent; indeed, they do not. Nonetheless, there is considerable overlap in the sources of bias for data on minority groups. The extent of this overlap permits certain general observations and recommendations to be made. Recognition of these problems and efforts to ameliorate them should benefit all segments of American society by making data available that apply to all citizens, including all subgroups of citizens.

Ethnic and Racial Bias in Population Census Data

Acquiring valid census data on minority groups is difficult. The chances of being included in the 10-year census data are affected by several factors including trust in the government, belief that census data will help oneself or one's group, belief that revealing oneself to government will not result in adverse consequences such as legal difficulties or deportation, and residing at a specific address.

These factors are not uniform across ethnic and racial groups in the United States. An important question is whether they are sufficiently different to interfere with collecting reasonably valid census data on various groups. Data would almost certainly be unreliable in the case of illegal immigrants. I would not trust the figures for many American Indian groups in the Upper Midwest. It also seems that alcoholics of lower socioeconomic status would be less likely to have a fixed address than alcoholics with higher socioeconomic status.

Census data can be influenced by other social factors that are not uniform across groups. For example, some Indians migrate seasonally between reservation and town; many Hispanics migrate between a residence in the United States and one in their country of origin; and many new immigrants from Southeast Asia move around the country in search of relatives or jobs.

Ethnic and Racial Bias in Sampling

Ethnic and racial biases also occur in sampling. Although it is difficult to select bias-free sampling methods, certain sampling sources, such as birth certificates, death certificates, and surveys in grade schools, seem to be more free of bias than others. For example, almost all deaths in the United States are recorded on death certificates, although the location and specified cause of death may be subject to bias.

Racial and ethnic sampling bias is likely in hospital and clinic admissions, phone directories and census tract data (Westermeyer 1985), surveys in high schools and colleges, and surveys in jails and prisons (Westermeyer 1982).

It should also be noted that differential death rates can affect sampling at later ages even with culturally unbiased sampling methods. For example, if 20 percent of a given cohort live to age 65 and 70 percent of another cohort live to the same age, it can be assumed that the survivors in the two groups differ in certain ways. This type of influence can greatly affect epidemiological findings, but epidemiologists are usually well aware of such potential sources of bias.

Ethnic and Racial Bias in Research and Data Collection Procedures

Bias can also be introduced in research and data collection designs. For example, data collection that includes only the number of drinks per week or month may underrate the extent of binge drinking, which is more prevalent in some groups than in others. Conversely, data collection that emphasizes the maximum number of drinks per drinking session or per day may underrate the extent of chronic daily drinking in a "titer" pattern, which is more prevalent in certain ethnic groups (Kunitz et al. 1971; Vitols 1968; Westermeyer 1972*a*, *b*).

Since there is no widespread agreement on the best criteria for defining "light," "moderate," or "heavy" drinking, it is prudent for investigators to use, as much as possible, quantitative measurements such as ounces of alcohol; volumes per unit of time; modal and maximum volumes per drinking session; and duration and pattern of drinking.

The interpretation of alcohol use data is greatly affected by the use of other drugs. For this reason, any study of alcohol use or abuse should include data on use of other drugs. However, it should not be assumed that use of other drugs besides alcohol is the same in different ethnic and racial groups.

Comparisons of alcohol abusers across ethnic and racial groups are fairly common. Such comparisons can be misleading, however, unless sampling and base population data are well known and understood (Westermeyer 1971). More studies should include comparisons between abusers and nonabusers within the same racial or ethnic group. Studying the variables associated with alcohol use and abuse while holding race and ethnicity constant might be a more fruitful and less biased research strategy for devising prevention and intervention methods.

Many data collection instruments for alcoholism and other drinking patterns fail to address ethnic and cultural issues adequately. This is especially true when the instruments are used in racial or ethnic groups to which the investigator does not belong. Designing research in consultation with anthropologists and others familiar with the target population can overcome this problem.

Sometimes data collection instruments fail to take into account the concomitants of alcohol abuse and alcohol dependence. This can be true even when instruments have been devised by clinicians, if the clinicians have limited clinical or research experience in substance abuse. The development of adequate data collection instruments requires the early participation of clinicians familiar with alcohol and other drug abuse.

Special attention should also be paid to the individuals collecting the information. If the data collector and the subject are from the same community, the subject may be concerned about confidentiality. If they are not from the same community, the subject may mistrust or feel uncomfortable with the data collector. Because rapport across ethnic and racial boundaries may require repeated contacts over a long period, procedures that involve regular changes of subjects may make it difficult to obtain reliable data from minorities.

Epidemiological data can help quantify the extent of a problem, show its distribution, suggest etiologic factors, indicate possible prevention or intervention approaches, and generate fruitful hypotheses. However, supplementary and complementary studies involving epidemiology and other research approaches are needed to get firm answers to questions about etiology, prevention, and intervention. Epidemiologists should be involved in suggesting and designing such research, which might include ethnographic studies, historical studies, studies of disease progression with and without treatment, treatment outcome studies, studies of medical complications, and social, political, and economic studies.

Another research problem is created by individual changes and drinking and other drug-taking behavior over the lifetime. Some alcohol abusers become abstainers, and ordinarily they should be classified apart from either group. Data from various ethnic and racial groups indicate that lifetime changes in normal drinkers may also vary widely among groups (Westermeyer 1972*a*).

Responses to interview items can also vary among ethnic and racial groups. Some groups may overreport symptom rates, for example. Ethnic variance occurs with a variety of mental health rating scales (Westermeyer 1986).

Ethnic and Racial Bias in Data Analysis and Interpretation

Surveillance, survey, and epidemiological studies on alcoholism can produce confusing results because data obtained on the same group by one or more of these methods may conflict. Searching for the cause of the conflict can lead to new and unexpected information that may shed light on methodological or on substantive aspects of alcohol problems. A multidisciplinary team including epidemiologists, ethnographers, and clinicians is best able to consider these conflicts. If possible, investigators from the target group should also be involved in resolving such conflicts.

Differences within any ethnic or racial group can also be valuable in understanding the causes and correlates of alcoholism and drug abuse, as well as in designing prevention and intervention strategies. Such studies can greatly enhance understanding of such factors as history, religion, migration, culture changes, behavioral norms, family dynamics, sex role, education, and socioeconomic status in the genesis of substance abuse (Westermeyer 1982).

Long ago, Galton noted the difficulty of distinguishing inherent cultural differences from the transmission of concepts, attitudes, behavior, and artifacts from one culture to another. This problem pervades the interpretation of much ethnic and racial data. As racial and ethnic boundaries are broken down by education, intermarriage, migration, legislation, and increasing secularism, the influence of various groups on one another is likely to increase. In particular, minority groups may be increasingly influenced by drinking practices of the majority, and vice versa.

Perhaps the most important consideration is the purpose for which a study is undertaken. Is it to assess the efficacy of public expenditures? Is it to learn how alcohol use patterns in a culture are related to alcohol problems? Is it to study possible causal factors? Once the questions are clearly stated, the selection of a proper methodology becomes much easier (Edwards 1973; Baily 1967; Treloar 1956).

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Conference Recommendations

Conference participants recognized that each minority group has unique problems and made specific recommendations to address them. The participants also identified a number of general research issues that apply to all the minority groups considered at the conference. These general recommendations are presented first, followed by recommendations concerning specific minority groups.

The recommendations presented here constitute a synthesis of those included by the speakers in their presentations and those developed by participants in the course of the 4-day conference. The order of recommendations reflects a grouping of related issues and does not imply a ranking of priorities.

General Recommendations

Continued support for secondary analysis of existing data sets. On the basis of data obtained from the various national surveys presented at the conference, rich possibilities exist for performing secondary data analyses on minority populations. For example, public use data tapes from the Hispanic Health and Nutrition Examination Survey (Hispanic HANES) and the National Health Interview Survey (NHIS) would permit investigations of relationships between drinking patterns, general health status, and morbidity for Hispanics and blacks. Alcohol consumption could be treated as both a dependent variable and a risk factor for those conditions on which data are available. Sources of support for secondary data analyses include the encouragement of proposals through existing grant programs and the procurement of research contracts to perform specific analyses of existing data sets.

Dissemination of information on national data sets. Information about existing national data sets and other data sources should be made available to researchers, associations, paraprofessionals, and others in the alcohol research field. This effort could include presentations at meetings, routine mailings, and the preparation of bulletins to be placed in newsletters and professional journals. The information disseminated should provide not only descriptions of existing data, but also details on the study sample, data collection methods, types of data items included, and a bibliography of research already conducted using the data set.

Standardized definitions and measures of alcohol use and abuse. Conference participants noted that different studies use a variety of measures of alcohol consumption and recommended the development of standardized quantitative measures to classify levels of drinking and to define terms such as binge drinking and abstention. The lack of standardized measures has plagued alcohol researchers for many years, and this problem further complicates comparisons among various minority and ethnic groups. Standardized definitions would facilitate comparisons of different studies for various groups as well as comparisons of longitudinal findings within a single group. Participants indicated that NIAAA, in collaboration with researchers in the field, should provide the leadership in developing these standards.

Standardized identification of race and ethnicity in data bases. Increased efforts were recommended to collect more specific and accurate racial and ethnic information regarding alcohol use and its outcomes. Data bases compiled by medical examiners and police have not been uniform or consistent in their identifier conventions. With the increased focus on the importance of alcohol and its relationship to intentional and unintentional injuries, participants believed that data collection for these problems must be specific for the race and ethnicity of the persons involved as well as for situational variables that characterize an injury event. Researchers may look to the Office of Management and Budget (OMB) for guidance in developing definitions for race and ethnic group categories.

More accurate recording of alcohol-related deaths. Causes of alcohol-related mortality are not recorded reliably on death certificates. This problem undermines a potentially rich source of epidemiological data for the general population as well as for specific minority and ethnic groups. Blood alcohol as a measure of alcohol-related deaths is unreliable because it is measured only when the death is unnatural or of unknown cause, and it does not discriminate between simple alcohol intoxication and longstanding alcohol disorders.

The validity and reliability of death certificate data were of particular concern to conference participants, because it is a commonly held belief that the recording of alcohol-related diagnoses may be influenced by race, ethnicity, and sex. Although validity is difficult to establish, participants indicated that the validity of death certificate mortality data may differ by ethnic group and gender. Therefore, special attention should be given to improving the accurate recording of such data.

Research on cultural variations within racial and ethnic groups. The cultural diversity within most racial and ethnic groups in this country has often been overlooked in epidemiologic and other research. National surveys frequently classify persons from similar racial or ethnic backgrounds into single categories, such as Asians and Pacific Islanders and Hispanics. This approach is useful for obtaining baseline epidemiologic data on major groups. However, subpopulations exist within these broader categories that merit more detailed study because their alcohol drinking patterns and problems deviate from those of the larger group described. Specialized intragroup comparisons are needed to identify factors that contribute to variations in the use and abuse of alcohol within broad racial and ethnic populations. For example, it would be useful to explore the influences of cultural traditions and norms, family processes, religion, and other cultural and ecological factors on the risk for alcohol abuse within racial and ethnic groups. Comparisons among specific subgroups would be particularly useful in developing culturally appropriate prevention and intervention strategies.

Research on the effect of immigration and migration on alcohol use. Immigrations, migration, and subsequent acculturation may have an important impact on the drinking behavior and attitudes of various minority groups. It was recommended that research on the relationship between immigrations and changes in alcohol consumption patterns could include longitudinal studies of newly arrived immigrants, as well as studies comparing new immigrants, earlier immigrants from the same country, and comparable groups in the country of origin.

Research on treatment and prevention issues. Research should be conducted to track minorities in treatment programs. Surveillance of minorities in alcohol treatment should include data distributions of patients by race and sex in particular treatment modalities. Studies should also be initiated to identify program models that are appropriate for various minority and ethnic groups—for example, programs that focus on psychological conditions, cultural behaviors, and other factors related to alcohol problems unique to particular minorities.

Research on the interaction of alcohol and other drug use. Conference participants suggested that the use of other drugs besides alcohol may vary across racial and ethnic groups. Since consideration of other drug use can greatly modify the interpretation of alcohol use data, epidemiologic studies on minorities and alcohol should include an examination of other drug abuse as well.

Continued need for small-scale studies. Much of what we already know about alcohol use among minorities has been derived from small-scale studies of specific racial and ethnic groups. These studies have included data collection at regional, State, and community levels. Small-scale studies have been particularly useful in uncovering many social and environmental factors that affect decisions about the use of alcohol and in devising appropriate alcohol education and intervention strategies. In addition, small-scale studies help to identify variables that may contribute to differences in the results of drinking. These variables can then be further explored in larger epidemiologic and survey research studies.

Need for ethnographic research. There is a strong need for the collection of ethnographic data to complement epidemiologic information, in an attempt to move toward explanatory levels of analysis and to establish causal relationships. Ethnographic research would enhance our understanding of the role of cultural history, values and norms, religion, migration, family dynamics, and socioeconomic status in the development or prevention of alcohol-related problems. Collaboration of ethnographers and epidemiologists will help to develop a broader understanding of alcohol use among minority groups and to explain why alcohol-related health problems vary greatly among and within ethnic groups.

Collaboration with minority experts in designing studies. In the past, many data collection instruments have lacked an intimate understanding of minority issues; for example, among Hispanics it is important to recognize differences in dialect in wording questions. Consultation with minority researchers and others who are familiar with the study population and who have clinical or research experience in substance abuse should be incorporated into research studies to maximize the sensitivity of these studies to cultural issues.

Continued liaison between the minority alcohol research community and NIAAA policymakers. This conference should mark the beginning of a collaborative process between minority researchers, individuals, and institutions concerned with minority populations and NIAAA decisionmakers with respect to research priorities for minority groups at the research grant or training level. These lines of communication must remain open if there is to be progress in understanding alcohol use, alcoholism, and associated problems among American racial and ethnic subgroups in this country.

Support for training of minority researchers. The training and support of minority researchers is a key factor in the successful implementation of many of the recommendations of this conference. The lack of minority scholars in the alcohol field is largely a result of the lack of opportunities for adequate education and scientific training. Conference participants recommended a vigorous recruitment and training program focused on bringing minority researchers into the alcohol field. This support should include special fellowships to allow minority members to work with NIAAA staff members and NIAAA grantees. Predoctoral fellowships were considered more likely than postdoctoral fellowships to attract adequate numbers of minority scholars to the field. Financial support and academic guidance during graduate education should have a greater impact on the training of minorities than help at later stages.

Recommendations for Specific Minority Groups

Conference participants met in smaller groups to formulate recommendations to guide research relating to each of four specific minority and ethnic populations addressed at the conference. The following sections present recommendations for research on black Americans, Hispanic Americans, American Indians and Alaska Natives, and Asian/Pacific Americans.

Black Americans

Research on particular black subgroups. Alcohol use and its consequences have not been adequately studied in certain segments of the black population. For example, institutionalized persons and the homeless population include sizable proportions of blacks who, though typically not covered by national sample surveys, are likely to be counted in mortality and morbidity statistics. Prison and military populations also have high proportions of blacks and should be included in studies of alcohol use by blacks. Finally, there is an increasing rate of black high school dropouts, especially in urban areas; research should investigate the possible association between this trend and alcohol and other substance abuse. Epidemiologic and ethnographic data on black subgroups will improve our knowledge of the varied uses of alcohol among blacks. Extensive intracultural analyses will permit comparisons of the use and misuse of alcohol among subgroups, focusing on factors that put blacks at high risk for specific alcohol-related problems.

Research on blacks in alcohol treatment programs. Comparatively little research has been done on blacks in formal alcohol, drug, and mental health programs. This information is needed to assess community responses within informal and institutional settings to the misuse of alcohol by blacks. Studies should explore factors that enable blacks and other minorities to recover successfully from alcohol dependence. Future studies should also examine the factors that promote abstinence in large segments of the black population and help to explain why blacks, on the average, are significantly younger than whites in treatment.

Longitudinal studies of blacks. No major longitudinal study of blacks is included in the alcohol research literature. Various black cohorts experience important differences in mortality from cirrhosis and other alcohol-related causes of death. Longitudinal research would contribute to an understanding of this phenomenon. Longitudinal studies can also clarify the issue of whether the low prevalence of alcohol problems among black youth and the higher prevalence among middle-aged blacks is a maturational effect or a cohort effect. Longitudinal studies could follow young blacks through the critical period during their twenties, when many alcohol problems arise. These studies should examine the factors that contribute to high rates of abstention among black youth and the reasons for the dramatic increase in alcohol abuse and alcoholism among blacks after they reach age 29.

Reconciliation of survey and mortality data on blacks. There is a significant difference in the level of alcohol problems among blacks as measured respectively by survey data and mortality data. Conference participants highlighted the need to improve reporting of alcohol-related causes of death on death certificates and the importance of designing valid survey samples of blacks so that these data sources would become mutually supportive in investigating the relationship between health, mortality, and black drinking patterns.

Hispanic Americans

Need to recognize the heterogeneity of the Hispanic population. Conference participants noted that epidemiological studies frequently fail to take into account the heterogeneity of the U.S. Hispanic population, whose members come from many different nations and cultures. It was recommended that Hispanics with known intraethnic differences–for example, Cuban, Puerto Rican, Mexican, Dominican, Central American, and South American ancestry–be studied to determine similarities and differences in drinking patterns and to identify norms that should be considered in developing effective education and prevention strategies. The data collected by the Hispanic HANES offer an excellent opportunity to carry out this type of investigation because this survey has interviewed large numbers of Mexican Americans, Puerto Ricans, and Cuban Americans. It was also suggested that regional variations in drinking levels among Mexican Americans be explored and that studies be undertaken to investigate alcohol use among special Hispanic subgroups not easily reached by surveys–for example, migrant farm workers and recently arrived undocumented immigrants.

Need for additional secondary analyses of existing national data sets. Conference participants strongly recommended further analyses of the Hispanic HANES and the 1983 NHIS Alcohol Supplement (and subsequent NHIS data) to strengthen our understanding of alcohol use among Hispanics. These data could be used in the following ways: to investigate the relationship between alcohol consumption and sociodemographic variables, with special emphasis on confirming recently observed relationships such as age-associated patterns of drinking among U.S. Hispanics; to investigate the relationship between drinking patterns and general health and morbidity; to characterize drinking patterns and problems across different Hispanic groups; and to examine differences among Hispanics who drink more than 1 ounce of absolute ethanol daily.

Need for mortality statistics among Hispanics. There is an urgent need for information on the prevalence of alcohol-related mortality among Hispanic Americans, including the various Hispanic subgroups. In the absence of a national mortality data set that identifies ethnicity, mortality data from those States that include ethnic identifiers could be used to obtain preliminary information about this problem. Another possible approach involves the application of computer techniques for selecting death certificates with Hispanic surnames to develop data sets for analyses of alcohol-related deaths. Although this method has its shortcomings, it can be used for preliminary analyses. In addition, linking Multiple Cause of Death data and the Fatal Accidents Reporting System (FARS) could be considered for the analysis of alcohol-related traffic deaths among Hispanics in selected States.

Analysis of alcohol-related crime statistics for Hispanics. Until recently, most statistics on the relationship between alcohol and crime were provided only on whites, blacks, and the total U.S. population. This situation changed with publication of the 1981 Federal Bureau of Investigation report, *Crime in the United States*. That report provided, for the first time, national statistics on Hispanics arrested for alcohol-related crimes such as public drunkenness, liquor law violations, and driving while intoxicated. Further analyses of these data and of information collected by the FBI Uniform Crime Record are needed to understand the relationship between Hispanic ethnicity, alcohol consumption, and crime.

Research on the effects of alcohol abuse on Hispanic families. Because of the prevalence of heavy alcohol use and related problems among Hispanic men, conference participants recommended that researchers examine how these patterns affect family adaptation and functioning. Of particular interest was the impact that Hispanic fathers have on their children through modeling and values conveyed through alcohol-related behavior. Participants also noted some evidence that acculturation may be changing Hispanic attitudes about alcohol use. Research should explore the impact of acculturation on values and norms in Hispanic families and how families pass values on to their children.

American Indians and Alaska Natives

Need for a national survey of American Indians. A nationwide survey of American Indians comparable to the Hispanic HANES should be conducted to yield baseline data on Indian tribal subgroups. Conference participants identified several important demographic variables that will need to be considered in designing this survey, including reservation or nonreservation location, tribal status, and sex. The sample should be large enough to support cross-tribal comparisons of female drinking patterns and comparisons of Indians living on or off the reservation or in urban or rural settings. It was also recommended that the Indian Health Service (IHS), with its crucial involvement in providing health services to American Indians, systematically collect data on alcohol use and abuse patterns among its clients.

Need to consider cultural diversity of Native Americans. A qualitative contextual component is especially important in epidemiological studies of American Indians, who come from a multitude of tribes, practice a variety of traditions, and share different values with respect to the use of alcohol. A contextual approach would contribute to a better understanding of the behavioral risk factors for alcoholism, the factors contributing to the first use of alcohol, and the community response to drinking.

Need for culturally sensitive drinking measures. Variations among minority groups in cultural attitudes, norms, and values regarding alcohol use have not usually been taken into account in the classification of drinking categories for minorities. For example, the pattern of binge drinking that may occur in some Indian tribes entails the consumption of large quantities of alcoholic beverages in limited time periods (e.g., weekends), followed by periods of abstinence. This episodic pattern might not be captured by alcohol consumption measures based on 4-week or 2-week recall periods. Culturally sensitive drinking measures are needed to capture the drinking behaviors of American Indians.

Research on American Indian women. More serious inquiry is clearly needed into drinking patterns among Indian women, the outcomes of women's drinking, and the mechanisms through which more women might seek help. The anomalous drinking pattern of Sioux women, who drink more than Sioux men and more than men in some other tribes, requires further investigation, as does the incidence of fetal alcohol syndrome and fetal alcohol effects among Indian offspring.

Need for alcohol-related morbidity data on American Indians. Laboratory and clinical assessments of morbidity are needed to derive more reliable estimates of alcohol-related morbidity among American Indians. These assessments might be facilitated by collaborative research arrangements between NIAAA and IHS, as well as by assistance from ADAMHA in refining IHS data collection methods on alcohol and drug abuse.

Longitudinal studies of American Indians. Longitudinal studies are needed to examine the natural history of alcohol use among specific American Indian populations.

Need to assess the effects of Government policies on drinking behavior. There is a lack of information on the effect of public policy on drinking behavior, particularly regarding education, advertising, and methods of dissemination of information in the intervention and prevention of alcohol abuse among American Indians. Indian reservations are an ideal milieu for public policy studies because they vary greatly in rules and regulations about drinking. It was suggested that NIAAA and IHS work together to identify and analyze Government policies that may influence American Indian drinking behaviors.

Asian/Pacific Americans

Need to study Asian/Pacific American subgroups. Research programs focusing on Asian/Pacific Americans need to distinguish between subgroups of the Asian/Pacific American population, recognizing the variability of cultures, attitudes, and behaviors associated with the various subgroups. National sample surveys are limited in their ability to break broad racial and ethnic categories into detailed subgroups. Special sampling strategies, such as those employed in the Hispanic HANES, could be devised to ensure the inclusion of sufficient numbers of Asian/Pacific Islander subgroups in future studies to develop reliable national estimates. Particular attention should be directed to recognizing Native Hawaiians as a distinct ethnic group, given their high proportions of drinkers and alcohol abusers relative to other racial and ethnic groups in the State. Data are also needed on Asian/Pacific Island subgroups that are relatively small in number, such as Tongans and Samoans. Finally, cross-national studies should be initiated to develop comparative data on alcohol-related behaviors in the countries of origin of Asian and Pacific Island immigrants. These specialized analyses are intended to assess the impact of different environmental influences on risk for alcohol-related problems among various groups.

Research on Asian/Pacific American families. Conference participants recommended family studies to examine the mechanisms of environmental, cultural, and genetic transmission of alcohol-related phenomena, particularly physiological effects, attitudes toward alcohol, and factors relating to the abuse of alcohol. Longitudinal studies could explore the development of alcohol-related behaviors among children, youth, and adults together with the factors associated with differences among the various ethnic subgroups.

Research on the flushing response. Epidemiologic and laboratory studies indicate that a flushing response to alcohol ingestion is prevalent in some Asian and Asian-derived populations and that it is genetically based. There is also some evidence that the discomfort of the flushing response might provide a deterrence to excessive alcohol use under some circumstances. Continued study of the flushing response and its relationship to alcohol consumption patterns will enhance our understanding of the role of genetics in susceptibility and resistance to alcohol abuse and alcoholism among Asian populations.

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